The Builder.

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Water Engineering.

THE author of the work published under this title* treats his subject under the following main divisions:—

1. Storage of Water.
2. Measurements of Rainfall and Drainage-flow.
3. Transmission in Artificial Ducts.
4. Flow in Natural Watercourses.
5. Water-power.
6. Supply and Distribution for Domestic Purposes.
7. Floods, and Means of Prevention and Regulation.
8. River Conservancy.

In the treatment of so comprehensive a subject the author has not confined himself within the limits of his own experience, but has more or less, in all the above heads, collated the results deduced from the experiments of the most eminent authorities, and has presented them in a compact and practical form, accompanied by very clear and detailed explanations, so as to render them easily intelligible to those who may not be able to cope with the higher mathematical calculations involved in hydro-dynamics. In the chapter devoted to reservoirs generally a table is given, framed from seventy-six examples, to show that the average depth of a reservoir has a ratio of about four-ninths to the greatest depth; but, as the majority of the examples cited are comparatively small works, the important element of the configuration of the site does not affect the calculation so much as in the case of very large reservoirs—such, for instance, as those existing in India and in the natural basins of great rivers, where the retaining embankment is very short, while the basin behind it is of enormous size. In those instances a ratio of two-thirds of the depth at the embankment will be probably found to be nearer the mark. In describing the details of construction of reservoir embankments, many useful hints are given; and with reference to the employment of puddle walls, the author justly remarks that, if so much importance is attached to the necessity of protecting a puddle wall from contact with water under great pressure, it might also seem to be of little use, and might be dispensed with altogether. Perhaps the author is not aware that out of the tens of thousands of reservoir embankments made by the native rulers of India in centuries gone by, especially those in the Madras Presidency, not one has been constructed with a puddle wall. The embankments were all made with earth carried in small quantities on men's heads and deposited in thin layers, which were consolidated by the constant tramp of the hundreds of labourers employed thereon, so that the material, being originally homogeneous, became so compacted a mass that leakage very rarely took place. The chief, if not the only, object of the puddle wall being to prevent leakage, its more obvious position, wherever it is necessary to use it, would seem to be on the *inner* slope; and as every large reservoir ought to have its inner slope covered by a substantial stone revetment, the puddle would be protected from atmospheric influence, and so the shrinkage, if any, would be confined to the surface. It is obvious that if the inner portion of an embankment is not water-tight, and so the hydrostatic pressure is brought directly against the puddle wall, the latter virtually performs the office that it would do if laid on the interior slope, at the same time being deprived of the support of one-half the mass of the embankment. If, on the other hand, the material of the inner portion of such embankment is homogeneous and water-tight, then the use of puddle seems superfluous.

In treating of the various methods of measuring the flood-volume of rivers, the author correctly questions the applicability of the formulæ deduced from the experiments on the large rivers of America to the small rivers of Great Britain. But the United States engineers have conclusively demonstrated the fact that the point in the flood-section where the maximum velocity is met with will be found, in rivers from 10 ft. to 20 ft. deep and upwards, to be not immediately *at*, but *below*, the surface, and that, owing to various causes, the section of the flood-velocity film assumes the form of a parabola. This being the case, the usually-accepted formulæ for ascertaining the mean velocity based on a ratio of the surface and bottom velocities require some modification in the case of rivers with a greater flood-depth than 10 ft.

A considerable portion of the volume is devoted to the application of water as a motive-power, and this important subject is treated very carefully and exhaustively. It is followed by a description of the various works connected with the supply of water for domestic purposes, and contains many useful particulars of some of the most recent large schemes undertaken for that purpose. In the chapter on "Floods," the author holds views which, though not accepted by many leading engineers, have, nevertheless, much to commend them. Mr. Slagg points out that a great deal may be done to mitigate the injuries arising from floods "by a judicious system of storage and regulation of the mass of water over and above the carrying capacity of the river," observing that "the storage required is not that of the same nature needed for the supply of towns, except subsidiarily, and for a comparatively small portion of the water to be dealt with. It is rather the regulation of the flow of the excessive rainfalls than the absolute conservation which is in this case the object of 'storage,' and this takes it out of the category of those impossibilities which have sometimes been said to exist in this matter," and "that, therefore, they cannot, as is sometimes affirmed, be separate questions, but *must* be considered together." The apportionment of the cost, which is always alleged to be one of the practical difficulties in solving the problem of prevention of floods, is met by demonstrating how the water or flood question is not one in which a given expenditure of money confers a benefit strictly in proportion to its amount. The abandonment by the French Government of the proposals for controlling the floods of the Seine by means of reservoirs has been quoted as sufficient to discredit the practicability of such a method, but it is simply an argument, so far as it goes, of the extent or limit within which the French engineers were prepared to deal with that particular instance. That it is a plan adopted by nature is exemplified by the gigantic lakes which are found at the sources of the great equatorial rivers, to which they act as regulating reservoirs, and that, but for them, the floods of such rivers as the Nile would, instead of being the means of fertilisation and a source of wealth to the country through which it flows, simply carry devastation throughout its length and breadth.

When treating of River Conservancy, Mr. Slagg replies to an observation made by Mr. Wheeler, in his pamphlet on the Fen Rivers of the East Coast, to the effect that the facts adduced by him are "sufficient answers to those theorists who are in the habit of advocating the formation of reservoirs to

* "Water Engineering: a Practical Treatise on the Measurement, Storage, Conveyance, and Utilisation of Water." By Charles Slagg, A.M.I.C.E. London: Crosby Lockwood & Son, 7, Stationers' Hall-court, Ludgate-hill.

regulate the streams and prevent floods," by stating that "nothing is intended to be conveyed by the 'theorists' more than that when suitable reservoir sites exist the flood-waters now flowing from the areas above them, to the detriment of the rivers, may be so regulated that the owners of those lands may substitute works for money in respect to their liability to taxation in contributing to the funds required for the conservancy of the rivers below them." The author's remarks respecting the incidence of the rating necessary to meet the expense of flood-protective works are so much to the point that they merit being quoted verbatim :—

"Whether we look at the agricultural interest, the mining and manufacturing interests, the tenant or the landowner, millers, highway boards, county magistrates, railway companies, carriers by water, or municipal authorities, we find them all implicated in the deterioration of the regimen of rivers, as well as the owners of the lands from which the water flows without regulation; and it is not one person, party, or body who should be called upon to repair and maintain the regimen of rivers, but all in the same river-basin, whether dwellers or receivers of rent, cultivators or owners of the soil; for all who have access to the river-banks contribute to its deterioration, while none does anything to improve it or even keep it in decent repair. The river is the first and chief cause of prosperity of the dwellers in the valley, whether they directly use it or not, and even though some of them never see it. Its repair and maintenance, then, is the duty of all, and if each would make good the damage he does, whether actively or by permission only, no one would have any right to call upon him to do more; but, as a practicable thing, this is out of the question, and he must contribute to a common fund according to his means and liabilities, if he wishes to continue to enjoy his own right in the river, and what it brings him, without injuring his neighbour thereby. A good many people have not only wished to have all these advantages without doing anything in return, but have actually had them and converted them into hard cash. They should be allowed an opportunity now of contributing something to the repair of the damage they have done. The apportionment amongst all parties, so as to be just to all, is not in this case a matter upon which hairs can be split, but a near approximation to strict justice may be made without much trouble—without, that is to say, more trouble than the redress of a long-standing and general grievance must necessarily entail."

There is one element of the water question, however, which, singularly, Mr. Slagg has omitted to include and discuss in his useful work, and that is, water transit, and it is all the more singular, seeing that the restoration and improvement of internal water communications, not only in our own country, but throughout the civilised world generally, is one of the foremost and most pressing questions of the day. The regulation, not only of floods, but of its waters generally, is of the utmost importance and essential to the well-being of every country; and wherever they are so regulated as to be restrained from doing harm by storage of the surplus, they will not only afford the means of meeting deficiencies in years of drought such as that of last year, but they would, when properly cultivated and judiciously regulated, contribute towards maintaining the navigability of rivers which would otherwise be impracticable, and also solve the difficulty often experienced of feeding existing canals with a sufficient supply. This branch of the water question also cannot, and ought not to, be considered separately; but though omitted in Mr. Slagg's book, he has, nevertheless, done good service in drawing prominent attention to the intimate connexion that exists between the various branches of water engineering—a fact which all those engaged in the development of water projects would do well to bear in mind.

Art Congress at Liverpool.—The detailed programme of this Congress, to be held next week, will be found on pp. 399-400.

"THE HOLY PLACES OF JERUSALEM."*

BY MAJOR CONDER, R.E.

PROFESSOR HAYTER LEWIS'S work† is of high importance to all who take interest in the main questions of Jerusalem archæology. It is the first expression of professional architectural opinion on two of the principal subjects of controversy, and will carry weight with it, especially as it has been deliberately prepared after more than one personal visit to the sites discussed. The late Mr. Fergusson always insisted that no architectural authority besides himself had been in the position to give an opinion of value. He put aside the views of De Vogüé and of Willis, equally with those of the Palestine explorers who followed. Prof. Hayter Lewis, possessing all the advantages of special knowledge concerning the ancient architecture of the Levant, has now given us his opinion, which proves fully to support those of De Vogüé, of Sir C. Warren, and of Major Conder, on both the great questions at issue, while adding the results of facts unknown when Mr. Fergusson formulated his theories forty years ago.

Two distinct questions are involved,—one of which is only slightly touched, while the other occupies the greater part of the volume. The first is the position and extent of Herod's Temple; the second is the character and date of the building known as the Dome of the Rock, in the Jerusalem Haram. As regards the first of these, Prof. Hayter Lewis's views accord with those expressed by nearly every writer who can claim authority, since the recovery by Sir C. Warren of the great Ophel wall south of the Jerusalem Haram. Mr. Fergusson believed, not only that the Dome of the Rock was a chapel built by Constantine over the Holy Sepulchre, but also that this was the real site of our Lord's tomb; and since it stands in the middle of the Haram area, it was a necessity of his theory that this area should not be co-extensive with that of Herod's temple, which he held to have occupied a square of 600 ft. side in the south-west part of that area. In favour of this view, which is controverted by Robinson, De Vogüé, Warren, and Conder, he adduces Josephus's estimate of the length of the Temple cloisters,—a stadium square; and on his plans shows the south-east wall of the city joining the supposed east cloister of his temple; for Josephus says that the Ophel wall "joined the eastern cloister" (5 Wars, iv. 2). Sir Charles Warren's excavations on Ophel were systematic and numerous,—fifty shafts were sunk, and the Ophel wall was finally discovered, not where Mr. Fergusson expected it to be,—600 ft. from the south-west angle of the Haram, but actually adjoining the south-east angle of the enclosure as now existing. This (if we follow Josephus) clearly points to the east wall of the Haram as the east wall of Herod's Temple cloisters; and as regards the estimated length of "a stadium" nothing could be less scientific than to rely on Josephus's estimate (writing in Rome), since a critical examination of that author shows us that his measurements are always unreliable, and his statements of distance, with his other figures, often self-contradictory.

Professor Hayter Lewis's objections (p. 16) to Fergusson's view as to the Temple seem to be fully borne out, therefore, by the above argument, to which he does not refer; and there are two other reasons which tend to the same conclusion. In the first place, the Talmud gives us detailed measurements, and other facts, concerning Herod's Temple, in a tract written in Palestine while the ruins were still distinguishable; and these cannot be reconciled with the small area proposed by Mr Fergusson. From the Mishna (Tract, Middoth or "measurements") it is possible to construct a ground-plan, which agrees with Josephus's account in all respects, except in his rough estimate of size.

The second additional argument concerns the sections of the Temple, and has already been illustrated with diagrams in the pages of the *Builder* (January 25, 1879, p. 94). The shape of the rocky Haram ridge has been traced by careful instrumental levelling. The rock is on the surface near the centre, and in the north-west; and beneath the surface it has been traced by seventy-five measurements, in well-mouths and vaults. There is thus no doubt as to where "the top of the hill," on which Josephus says the Temple stood, actually exists in the area; and it is an argument which should carry conviction to the minds of builders, that Mr. Fergusson's theory necessitates, beyond dispute, foundations from 30 ft. to 90 ft. deep to reach the rock (on which the heavy walls must have been founded); whereas, if the Temple stood where the Dome of the Rock now stands, its courts, descending by steps, would have roughly coincided with the position of the present "platform" and outer courts of the Haram; and it is found that only foundations of 2 ft. or 3 ft. would thus be necessary (see the block plan published in the Jerusalem volume of the Palestine Exploration Fund Memoirs). Plans of the Temple prepared before these facts were known not unnaturally disregarded questions as to foundations, and these practical considerations may not be understood by purely literary students of the question: but the results of excavation and of levelling will take precedence in the minds of architects over ancient rude descriptions. Not a trace of the walls which Mr. Fergusson expected to be found has proved to exist; the south-west, the north-west, and the south-east corners of the Haram agree in character with the ancient accounts of the corresponding corners of Herod's enclosure,—the Tyropœon bridge having been discovered at the first, the rocky scarp and outer fosse of Antonia being recognised at the second, and the Ophel wall having been discovered at the third. Thus the views of the majority of antiquaries have been shown to be correct, by the discoveries of engineers and surveyors, and are now supported by the professional opinion of a scholar and an architect. Knowledge has taken the place of theory, and Professor Hayter Lewis remarks very truly that the question of the "site of the Temple is not to be lightly entered upon by any one, until he has made a special study of the descriptions and references scattered through the various books of the Bible, the Talmud, Josephus, and other writers, and made himself acquainted with the elaborate drawings (published by the Palestine Exploration Fund in their volume on Jerusalem) to which I have referred." Many of these drawings are reproduced in the pages of the work now under consideration.

The second question is that of the origin and date of the Dome of the Rock. When Mr. Fergusson wrote first in 1847, the Haram was closed to Christians. Mr. Catherwood's drawings,—good as they were,—gave imperfect information, and were in some respects misleading. There was a *prima facie* case in favour of the building being of Byzantine character, and the inscriptions on its walls were unknown. Mr. Fergusson's contention that this site was the true Sepulchre of Christ (as Professor Hayter Lewis remarks) never took root. All recent writers have condemned this feature of his theory; and the information since collected from ancient texts and from exploration has satisfied all later writers that Constantine's basilica of the Holy Sepulchre stood on the site afterwards covered by the Crusading Cathedral, which still exists as a church.

The question as to the real origin of the Dome of the Rock was, however, not placed on a scientific basis until the appearance of De Vogüé's splendid work, "Le Temple de Jérusalem," in 1864. His plans of the area have been superseded by the survey of Sir Charles Wilson, published in 1865, but his study of the interior of the Dome of the Rock still remains a standard work. De Vogüé rejected alike the Temple theory and

* As the author of this review has himself taken an important part in some of the discussions about the topography of Jerusalem to which reference is made, we have thought it best, with his consent, to depart from our usual practice, and append his name to the article.—Ed.

† "The Holy Places of Jerusalem." By T. Hayter Lewis, F.S.A. Murray. 1888.

the Sepulchre theory of Fergusson, and with one important exception, which must be considered an improvement, Prof. Hayter Lewis is generally in accord with De Vogüé's views on both these questions.

No ancient chronicler or geographer attributes the Dome of the Rock to Christian builders. The Moslem and the Christian accounts agree in making it a Muhammadan building. The inscriptions existing on its walls give it the same origin. It is unnoticed by any writer before the Moslem period, the oldest known accounts being that of El Mukaddasy in the tenth century (985 A.D.) with El Yakûbi's notice of its erection (874 A.D.) by 'Abd el Melek, the Damascus sultan, in the year 688 A.D. The earliest-known Christian writer on the subject is Eutychius, in 940 A.D. The inscriptions, which were first published by De Vogüé, include the important Cufic text in the interior, which gives the date of the erection of the *Kubbeh* as 72 of the Hegira, and the later texts of El Mamûn on the bronze of the outer doors, giving the date 216 of the Hegira (831 A.D.). To these has now been added an early date on the rafters, found by Dr. Chaplin in 1881, which corresponds to 913 A.D.

It may appear curious that in face of such evidence any question should remain; but it is indisputable that the pillars supporting the Dome of the Rock, and in its arcade surrounding the dome, are of Byzantine origin. De Vogüé pointed out that they were not in their original position, having been re-used by the Moslems (according to a very common Arab practice), and taken from some former building. In 1873 Major Conder made drawings of these pillars, which Professor Hayter Lewis reproduces (page 42) with the following remarks:—

"I may take the words of Capt. Conder (*Transactions*, Royal Institute of Architects, 1878-9, p. 36): 'Only those of the capitals under the dome are alike; the rest differ in size, in outline, and in details. One of the capitals is evidently placed on a shaft which did not originally belong to it, but which required a larger capital. The sixteen capitals in the screen are more uniform. Two of these capitals are, however, of entirely different design, and their shafts longer than the others. The original bases are now covered with marble flagging, but this was removed in 1874, and it was then found that they differed in outline and height, viz., from 4 in. to as much as 17 in.' With this description I [Professor Hayter Lewis] entirely agree, after very careful and repeated examinations on the spot."

With this detailed examination of the pillars the real prop of Mr. Fergusson's theory is cut away. It was from an inspection of Catherwood's drawings of the capitals that he formed the opinion that the building must be Byzantine, and until the re-use of older material had been demonstrated, the opinion not unnaturally commanded respect. Professor Hayter Lewis does full justice to Fergusson's ability in these words (p. 55):—

"I have pleasure in bearing testimony to the fact that in this, and in the other Jerusalem buildings, my esteemed friend Mr. Fergusson made the only serious mistakes which are to be found throughout the interesting and learned histories of ancient and mediæval architecture, for which we owe him so much."

The point in which an advance has been made on De Vogüé's work is one which was first brought forward by Major Conder ("Tent Work in Palestine," 1878), and which now receives the important confirmation of Professor Hayter Lewis's approval. The *Kubbet es Silsileh*, or "Dome of the Chain," is a smaller building east of the Dome of the Rock. Muhammadan writers say that it was the model from which the Dome of the Rock was built. It resembles the latter except that the outer octagonal wall, including the two circles of pillars, does not exist in the smaller building. The question raised is whether this octagonal wall existed when the Dome of the Rock was first built by 'Abd el Melek. It has been pointed out that the dates on the gates and on the rafters belong to a period later by a century and a half than that recorded on the arcade enclosed by the wall. The outer wall appears to be first mentioned in 903 A.D., and an earlier writer is quoted by Prof. Hayter Lewis,—namely, El Yakûbi, in 874 B.C.,—who says that "'Abd el Melek built above the Sakhrah" (or Holy Rock now shown within the Dome of the Rock) "a dome, and hung it round with curtains of brocade." There is no distinct mention in this of the outer wall. The question is one of secondary importance, but it appears quite possible that this outer wall was not part of the seventh century structure, but an addition by the later Khalif el Mamûn, in 831 A.D.

There is a question of some interest connected with this outer wall which, though it has elsewhere been discussed by Prof. Hayter Lewis, is not mentioned in the present volume. The outer walls are adorned by arcades, with a small upper balustrade, of which a drawing is given (p. 36), and which Prof. Hayter Lewis is inclined to attribute to the ninth century A.D. This arrangement should be compared to that of a very interesting building at Ammân, east of Jordan, which was fully described with detailed drawings by the Survey Party in 1881. The general style of the latter building connects it with the Sassanian architecture of Persia. There is evidence that the building existed in the tenth century A.D., and not only do the details of the architecture recall those of the Dome of the Rock, but the chased stone-work bas-reliefs present a general similarity to the mosaics of the Jerusalem building. The proportions of the little dwarf pillars, and their coupled arrangement, also recall features of the Jerusalem balustrade and its pillars; and the simple capitals are similar. This comparison strengthens Prof. Hayter Lewis's conclusion (p. 72), when he says:—"Finally, I must express my full belief that the Dome of the Rock was the work of the Arabs, designed for them by a Byzantine or Persian architect, and with Persian and Byzantine workmen, before the Arabs had developed any definite style of art of their own; and that it was built with the capitals, bases, and columns ready to hand, being derived from the remains of churches and other buildings, destroyed by Chosroes and other invaders."

The conclusion so reached is one which has been consistently maintained from time to time in the pages of the *Builder;* and which, being supported both by architectural opinion and by the discoveries of explorers and of antiquarian scholars, will, no doubt, survive as the settlement of a controversy which has been very thoroughly threshed out. When Mr. Fergusson first wrote, the subject was imperfectly understood. An unnecessary personal element crept into the controversy, from which the present volume,—representing the opinion of a competent and impartial judge—is perfectly free; and the fact is simply, that a *primâ facie* case failed to become established when the evidence was fully recorded.

That Prof. Hayter Lewis is correct in stating that the Dome of the Rock "never was a mosque, and that the name Mosque of Omar, by which it is commonly known, is misapplied," all who have studied the subject and who are familiar with mosques will agree. There is a very ancient mosque at Ammân, probably as old as the ninth century A.D., since all its arches are round, like those in the Dome of the Rock, and neither pointed nor "horseshoe." This building, and the great Mosque at Damascus which is of the same age, and of which we have here the plan (p. 69), present the same arrangement which may be observed in buildings of any Moslem age meant for Muhummadan worship. In such worship those who are performing the regular prayers stand side by side in line, with a fugleman (the Imâm) in front, opposite the *Mihrab* or prayer apse. Thus long rectangular buildings are suitable, and were erected save when a Christian basilica could be converted into a mosque, by making a *Mihrab* in the south wall. Evidently an octagonal building, with the centre filled up by the sacred rock over which the dome forms a permanent canopy, could not be used for regular prayers. There are often, however, such *Kubbehs* or oratories in the precincts of mosques, as at Mecca or in Damascus, where the "Dome of the Books" stands in the courtyard of the great mosque. The Dome of the Rock was such an oratory. It is to be supposed, however, that Prof. Hayter Lewis is only quoting Mr. Fergusson's opinion when he says that the Dome of the Rock is "wanting the niche or *Mihrab*," p. 11. There are several *Mihrabs* in this building, the principal being in the south wall of the outer octagon, east of the south door. It is shown on the Ordnance Survey Plan reproduced in this volume, p. 31, and was, no doubt, seen by the author. It is specially curious, because it is flanked by two elaborate pilasters of Mediæval origin, which were adorned by small human heads on the capitals. The heads remain, but the features have been purposely defaced by the Moslems. Muhammadan pilgrims after walking round the Sacred Rock pray at this *Mihrab*, as part of their pilgrim duty.

There is another point which may be mentioned, though it is a detail not affecting the general principles on which the two main controversies are treated in the present work. In speaking of Sir Charles Warren's opinion that the outer walls of the Great Haram are (as regards their base-courses) the work partly of Solomon, partly of Herod, Professor Hayter Lewis remarks (p. 5):—"It is no mere guess which assigns their foundation-courses at least to the age of Solomon." Evidently he refers to the discovery of rudely-painted letters on the foundation-courses at the south-east angle, which were among the most interesting of the results of those perilous and exhaustive excavations, by which Sir Charles Warren succeeded in substituting knowledge for opinion.

But neither he nor the present author would claim special knowledge as to the date of these letters. They were referred to the late Dr. Deutsch, who called them Phœnician—and the Phœnicians did use such mason's marks, as we know from the case of a wall at Eryx. When, however, this opinion was pronounced, on marks which are roughly shaped, our information as to the history of the native alphabet in Palestine was extremely meagre. It is now known that the forms of the letters used, down to the time of Herod, do not very materially differ from those of an earlier age. It is quite as probable that these marks were painted by the masons of Herod's age, as that they were scrawled in Solomon's time. They serve to show that the masonry is not later than Herod, but they are insufficient evidence of the work of Solomon. We do not know that the Phœnicians or the Hebrews at that age (or in any age before the Greek period) used what is called "drafted masonry." Our only examples in Palestine of this masonry belong to the Greek and to the Roman periods.

Nor is there any very cogent reason for supposing this splendid masonry at Jerusalem to belong to two periods separated by a thousand years. There are no important straight joints, no great difference in size, finish, or preservation of the stones. In some places, it is true, the stones have rough faces, but this is in the parts where they were not intended to be seen.

De Vogüé's opinion has been overlooked, according to which the walls (below the level of the Byzantine restorations) all belong to one date, being entirely the work of Herod the Great. Josephus tells us not only that Herod enlarged the Temple enclosure (as noted by Professor Hayter Lewis), but also that "he took away the old foundations" (1 Wars. xxi. 1.). There is no evidence to show that we possess, at Jerusalem, a single stone of Solomon's Temple. The tooling of the stones (which is peculiar) is the same in all parts of the wall where the masonry was intended to be seen, and it is not very probable that Solomon and Herod would, not only have used stones of the same dimensions, but would, moreover, have used an adze of the same size and number of teeth to dress their stones.

As regards the Golden Gateway on the east wall of the Haram—a building clearly of

Roman origin, Professor Hayter Lewis is inclined to agree with De Vogüé as to its being of the age of Justinian (p. 96), and the work of a Byzantine architect.

As regards the Aksa Mosque, which occupies the south wall of the Haram, standing probably on the site of Justinian's Great Mary Church, Prof. Hayter Lewis's views are entirely original, and demand careful consideration. He believes the original Aksa to have been much larger than the present building. There is no doubt that the present building is also a structure in which Byzantine materials have been re-used by Arabs, while the north porch is twelfth-century Norman work, and the large building to the west appears also to have been built by the Templars, as described by Theodoricus. A crusading apse has also been added on the present east wall, and the remains of piers, still traceable outside this wall towards the east, may prove to support Professor Hayter Lewis's view. He has, however, not called attention to the north door of the building, which De Vogüé believed to be Byzantine. El Mukuddasy's description unfortunately gives no measurements, and it is perhaps questionable whether from such an account a restoration can be made which will be generally accepted, in absence of existing remains to control our reading of the vague descriptions which we possess.

As regards the basilica built by Constantine, on the site of the present Cathedral of the Holy Sepulchre, we again have to depend chiefly on a non-scientific description by Eusebius. It has been variously understood, but Prof. Hayter Lewis concludes for a "plan of the hemisphere much as is suggested by De Vogüé and by Capt. Conder." If a comparison with Constantine's Bethlehem basilica is held to be of value, there can be little doubt that the Jerusalem basilica resembled, in plan, the countless chapels of the age scattered throughout Palestine, with a large apse to the east, a narthex to the west, and an open atrium on this side, outside the covered basilica.

The last two chapters of Professor Hayter Lewis's work have reference to recent discoveries concerning the probable site of Calvary, and the Siloam tunnel. The first refers to the curious knoll, outside the north gate of Jerusalem, which is, by Jewish tradition, identified with the place of execution before the destruction of the city. The idea that this was the probable site of Calvary is not very new; but the discovery of the Jewish tradition in question—which was made by Dr. Chaplin—was first published by Major Conder in 1878, and forms quite a new element in the question. Sir Charles Wilson, in a note, questions the continuity of Jewish tradition on the subject. The site, however, agrees well with the Talmudic account of the place of execution, and the Jewish tradition is at least as likely as any Christian tradition to be continuous, for we know of the presence of Jews at Jerusalem in all ages from the time of Christ; we can prove their residence in the second, third, fourth, tenth, and twelfth centuries; and the periods intervening are not those in which they are least likely to have inhabited the Holy City. This new identification of a site for Calvary "without the gate"—and not as is the ecclesiastical site, nearly in the middle of the town—was adopted by General Gordon during his stay in Palestine, and has become widely known to visitors. It may at least claim a great degree of probability, in the eyes of those who agree with Robinson in subjecting monkish traditions to severe critical examination before accepting them as evidence.

As regards the Siloam tunnel, it may be regretted that—even as a theoretical line—Prof. Hayter Lewis should show a second tunnel, independent of that which actually exists. No such additional tunnel has been found to be mentioned by any ancient writer; it was, in fact, invented by a theorist, whose views did not square with the fact of the existence of the real tunnel; and excavations in search of it failed entirely to recover any such channel. Being double printed in red it might with advantage be omitted in a future edition (see page 122).

A number of the illustrations which adorn these pages are taken, with due acknowledgment, from the "Jerusalem Volume" of the Palestine Exploration Fund Memoirs (written by Sir C. Warren and Major Conder), with a few from other publications of the same society. Prof. Hayter Lewis has, however, added several important plates, which are of great value for comparative purposes, especially those from the Spalato Palace (pp. 52 and 94) and the interesting drawing of the Dome of the Rock by Breydenbach in A.D. 1486 (p. 32). To those who wish for a summary of results, scattered through expensive volumes, these reproductions, with the new plates added, will be valuable, and they allow of independent judgment on the subjects thus ably set forth. It is to be hoped, however, that the diagram showing various views as to the walls of Jerusalem (p. 5) may hereafter be improved. It gives, for instance, an incorrect view of the junction of the Ophel wall, according to Sir C. Warren and Captain Conder. There is no difference of view between these two officers at this point, where actual discovery sets the matter at rest, and neither of the lines shown on the diagram is quite correct. The "so-called Tombs of the Kings" is also an unfortunate survival, as Robinson's identification of this monument with the Tomb of Helena of Adiabene, mentioned by Pausanias and Josephus, is accepted by all scholars.

Professor Hayter Lewis also gives a cut of a small pilaster in the church of St. Marie la Grande (p. 38), and suggests that it may have belonged to the original Hospice of Charlemagne on or near this spot. It is doubtful if this can be maintained. It appears rather to belong to the Crusading Church itself,—one of the earliest built after the capture of the city by Godfrey.

The present work is valuable, therefore, not only on account of its containing a competent judgment on two much controverted questions, of high importance to the study of Syrian antiquity, but also as showing clearly the great advance that has been made in our scientific knowledge of the subject. When Fergusson and Robinson first engaged in controversy, the question was almost entirely literary. The sketches of Catherwood alone existed as evidence. The survey of the city was not commenced, the highly important "Siloam inscription" was unsuspected to lie hidden in its tunnel, the levels of the hills and valleys of the old city had not been measured, the detailed examination of buildings within the Haram had not become possible, the important excavations of Sir C. Warren were yet in the future. Those who now write on Jerusalem without having studied the results obtained from the last twenty years of exploration can no longer be considered competent to expound, on literary grounds, questions which have been settled by the architect and the engineer on the spot. The chief results have been the recovery of the existing walls of Herod's Temple enclosure; of the mighty Ophel wall joining its eastern cloister; the determination of the Dome of the Rock as an Arab building of the seventh and ninth centuries of our era; the generally-expressed consent to the site of Constantine's basilica having been where the Holy Tomb is now shown, together with many other important discoveries concerning the city in various ages, which are not mentioned in the volume before us, as having no connexion with its subject, but which may be studied in the "Jerusalem Volume," to which Prof. Hayter Lewis refers throughout with cordial approval.

C. R. Conder.

The Sanitary Institute.—The first ordinary general meeting of this Institute was held on November 22, Sir Douglas Galton, F.R.S., in the chair. The Council reported the successful commencement of the Institute, nearly 500 Members and Associates had been enrolled, and the Institute had before it a large field of useful work. The Duke of Northumberland was elected President of the Institute, and Inspector-General R. Lawson, LL.D., was duly elected as treasurer of the Institute.

NOTES.

THE proposed new telegraphic communication with the Australasian Colonies, *viâ* Canada, Vancouver Island, and the Pacific, has lately excited considerable interest. The Pacific Company are prepared to lay a new cable from Vancouver Island to Australia (touching Hawaii, Fiji, and New Zealand), and to effect great reductions in the through rates, provided the Government will guarantee traffic to the extent of 75,000*l.* per annum. This is a very large sum compared with the present Government traffic; and, even allowing for the Canadian business, the amount would probably have to be considerably reduced before the scheme could be entertained by Parliament. On the 23rd ult. the Earl of Winchilsea presided over a meeting largely attended by Australian merchants and others, and explained that the proposed new cable would connect with strong, dependable existing lines, and form a more reliable connexion than we have at present, besides being very much cheaper; indeed, subject to the guarantee alluded to, he intimated that the tariff would be reduced from 9s. 8d. to 4s. a word. This, of course, is an enormous inducement to persons doing business with the Australasian colonies to support the scheme; and (equally of course) provokes strong opposition on the part of the existing lines. The committee of the Eastern Extension Company, whose line was established in 1871, say that the interruptions in their service have been due to exceptional circumstances,—volcanic disturbances, &c., and that the proposed line could not be certain of immunity from interruption any more than theirs. It is certainly a question as to which line could be most easily protected in the event of war, for, while the old route is admittedly accessible at many points, there is in the new route the long overland portion of the connexion to be considered. The promise of a reduction in the tariff brings from the Eastern Company a renewal of a proposition made by them a year or so back, which they consider would lead to the establishment of a cheaper rate on more favourable conditions than could be obtained in any other way. They suggest that the Imperial and Australian Governments should guarantee the Eastern and its associated Companies three-fourths of their present earnings, when they would be in a position to give the Colonial Governments full control over the tariffs. We should be very pleased if the agitation were to result in a reduction in the truly restrictive rates at present in force. The Pacific cable would involve an enormous outlay, and there would have to be a very great increase in the Australasian cable traffic to enable the Company to make the comparatively low charge of 4s. per word remunerative. Otherwise the venture would prove, as a pessimist correspondent once prophesied of the Manchester Ship Canal, "a great benefit to all concerned, with the somewhat important exception of the shareholders."

THE case of Cooper *v.* Straker, recently decided by Mr. Justice Kay, appears to us much ado about nothing. It was an action for the infringement of the light of a wool warehouse, and the defence was that actual enjoyment of the light within the meaning of the Prescription Act had not existed for the statutory period, because the windows were seldom opened, and were usually kept closed up with iron shutters. The judge held that there had been a sufficient enjoyment to give the plaintiffs the right to the light. It seems to be clear that, so long as there is an opening in the nature of a window, and so long as the light is allowed to pass through from time to time, the fact that for considerable periods shutters are put up can make no possible difference. If it were otherwise, we should find persons losing their right to light because they were out of town for the summer, and their shutters had been up from August to October.

THE Archæological Society of Athens have at last decided to satisfy the long-aroused curiosity of all classical students as to the extraordinary paintings reported to have been found in the early palace at the top of the Mycenæ hill. In the last issue of the "Ephemeris Archæologike" (dated 1887, part 4), which has just appeared, a coloured facsimile of the most important fragments is given, with descriptive text by the discoverer, M. Tzountas. The bulk of the designs are made up of vegetable and geometrical motives, with a great deal of spiral work, but the human element is not wholly absent. The greatest interest will, however, be roused by the fragment depicting three ass-headed monsters carrying a pole. The colours used are blue, two shades of brown, and red. However interesting the technique, it is the form of these monsters that is of paramount importance. Unquestionably they bear a close resemblance to the monsters depicted on the "island's gems," published and discussed by Milchhœffer. Dr. Milchhœffer described his monsters as horse-headed. The Mycenæ monsters are, undoubtedly, according to M. Tzountas, ass-headed. It will probably turn out that the heads of the monsters on the "island stones" have been wrongly identified, owing to their small size and indistinct cutting. On one of the seven island stones discussed, the monster is carrying a pole, from the ends of which hang the dead bodies of wild animals he has killed. Unfortunately, in the case of the Mycenæ paintings, the ends of the pole which the three monsters are carrying are missing, but there is a high probability that they carried game. Surely here we have the prototype of the game-carrying Centaur, and, we may conjecturally add of the Herakles carrying the Kerkopes. Moreover, we have, what is even more important, an undeniable link in the chain of evidence that connects the art of the ancient East and West.

IT is satisfactory to learn that the Forth Bridge has passed through the stress of the recent high gales without the slightest trace of injury or sign of weakness. The greatest wind pressure occurred on Friday, the 16th ult., when 27 lbs. per square foot was recorded on a large board of 300 square feet in area, while 41 lbs. and 35 lbs. respectively were recorded on two smaller boards of $1\frac{1}{2}$ ft. square, all being on the Island of Inchgarvie. An average pressure of 32 lbs. per square foot was registered at the other portions of the bridge. Actually a wind pressure of 56 lbs. has been provided for in the design. Between the two cantilever end piers there is the enormous total pressure of 8,000 tons allowed for wind alone. It is satisfactory also to learn that not one of the 100 cranes which are perched about over the structure sustained the slightest injury.

A REPORT of a somewhat curious case under the Metropolitan Building Act reaches us. It seems that Mr. Henry Jarvis, District Surveyor for Camberwell, summoned a Mr. Owens, of Manchester, before Mr. Biron, sitting at the Lambeth Police-court, on the 20th ult., for having set up under a large canvas booth (used as an auction-room) a wooden structure of a movable or temporary character, without a licence from the Board, as required by the Metropolis Management and Building Acts (Amendment Act), 1882, 45 Vict., ch. 14, sec. 13. The structure consisted of a wooden platform, formed of flaps, partly hung to the framework of a van, and supported in front and underneath by eighteen wooden posts about 3 ft. 9 in. high, resting on the ground. This platform extended 5 ft. beyond the van at either end, and had a movable sloping roof of wood, supported in front by six wooden uprights. It was urged in defence by Mr. Owens' solicitor that the so-called structure was simply a portion of the van, and could not be considered a movable structure as contemplated by the Act. After hearing the evidence the magistrate adjourned the case in order that he might view the structure. At the adjourned hearing the magistrate gave his decision, and said the defendant ought to have obtained a licence, and he fined him 1*l.* and 2*l.* 4s. costs.

A PROJECT for another ship canal is mooted. A correspondent of the *Times*, in calling attention to the scheme, says:—"The little peninsula of Wirral, which lies between the estuaries of the Mersey and Dee, has at all times been a favourite spot with the promoters of ship canals. A map, dated 1811, and headed 'The Proposed Manchester Ship Canal,' shows an extension of the Ellesmere Canal from its original outlet at Ellesmere Port to Tranmere Pool—a scheme which is now being carried out, save that the entrance is placed at Eastham, 5 miles higher up the river. The silting-up of the Dee, which resulted from the formation of the new cut and the reclamation of the upper bed of the river, gave rise to many projects for a canal from Chester, through Wirral, to Thurstaston or Dawpool, and attempts were made in 1837 to form a company to carry out Sir John Rennie's plans. A more feasible idea was that of cutting through the low-lying plain of Leasowe to form a direct channel from the Irish Sea through Wallasey Pool, then a natural tidal harbour, to the Mersey, thus obviating the risks and delays caused by the sandbanks at the entrance to the Mersey; and in 1838 Telford, Robert Stephenson, and Nimmo made surveys and issued an elaborate report, estimating the cost at 1,400,000*l.* As this was too large a sum for the promoters, among whom were Lord Clive, Sir Henry Parnell, Sir John Tobin, and Mr. William Laird, a further report was issued, in which it was shown that the principal features of the plan could be carried out for half the money. The scheme was frustrated by the Corporation of Liverpool, who privately bought up the land on each side of Wallasey Pool. It is now proposed to carry it out." In its salient features, the plan now proposed for execution is described as being mainly a reconstruction of Telford's scheme, and it appears to be quite practicable. The project, if carried out, is likely to be of great benefit to Birkenhead.

THE Cantor lectures on metal alloys, recently delivered by Professor Chandler Roberts-Austin, seem to introduce us into a realm governed by the most occult laws. With the lectures as a series we are not now concerned. We merely note a few of the marvellous facts relating to the influence which minute percentages of foreign bodies exercise on the metals. Those who have studied the effects which the metalloids have upon iron and steel, and who are familiar with the almost infinite series of alloys of copper, tin, lead, and zinc, have often wondered how minute differences in relative proportions affect most characteristically their resulting physical properties. Professor Roberts-Austin has performed many experiments, which go to prove that similar effects occur with alloys of metals generally. Thus, pure gold has a tenacity of seven tons to the square inch. Alloyed with copper in the proportion of nine parts to the hundred, its tenacity is increased to eighteen tons per square inch. But if to this alloy there is added one two-thousandth part of its mass of lead, the tenacity is reduced to five tons, and the golden colour is changed to an orange-brown. Pure bismuth crystallises in broad mirror-like planes, and reflects light, but the addition of the one two-thousandth part of tellurium thereto produces a minutely crystalline structure, which scatters the light. One-thousandth part of antimony suffices to change best selected copper into the worst conceivable. Mr. Preece's remark is cited,—that a cable made of the purer and better conducting copper now manufactured will carry twice as many messages as cables of the less pure metal made in 1858. Again, two-tenths per cent., by weight, of carbon introduced into iron produces a material suitable for bridges and boilers, but a sword made of this material would bend. An addition of eight-tenths per cent. of carbon is necessary for a razor, but this material would be useless for a bridge or rail. The numerous facts, of which these are typical, are not to be explained by the formation of ordinary chemical compounds, based on combining weights. Mr. Austin attempts to connect them with the Periodic law of the elements. Those elements whose atomic volumes are more nearly identical form, by their union, the least fragile compounds, and *vice versâ*. Could such a law be established, much of the tentative work of the practical metallurgist might ultimately be saved.

WE extract the following from a report by Mr. Spear to the Local Government Board (dated October 26 of this year) on an outbreak of diphtheria in the Dingestow Registration Sub-district of the Monmouth Rural Sanitary District:—

"The cottages are generally very small, and in many cases are in a bad state of repair. The stone or brick floors, and the walls, show obvious signs of dampness, and where the floors are boarded the wood is often laid upon the bare earth. Surface paving and drainage around the cottages are generally wanting, so that a sodden condition of surroundings is the rule. Sewage is allowed to make pools in the vicinity of the dwelling, or to flow into some watercourse, often silted up and stagnant, close by; and, where animals are kept, the close proximity of cow-sheds, pigsties, &c., and the absence of proper drainage, lead to much additional offensiveness. Privy accommodation is of the roughest and most primitive description, but is generally provided at some distance from the dwelling. Water is commonly obtained from some spring, or "runner," in a neighbouring field or woodland fairly removed from habitations; occasionally from wells sunk in sewage-sodden earth. In dry summers many of the sources, it is said, fail."

Mr. Spear also comments on the luxuriant growth of trees in close proximity to many of the little hamlets, and in winter the condition of the by-roads which lead to many of the cottages as further conducing to the ills which arise from damp habitations and sites. He adds, at the conclusion of his report, speaking of the district generally, besides the places which have specially suffered from disease:—

"An enormous amount of sanitary work, that, from the circumstances of the scattered population, can in most cases only be carried out in small instalments and in detail, is required; the population, moreover, is of the kind that needs close supervision, and the sanitary authority should consider whether, with the very wide area, comprising some 83,000 acres, under their jurisdiction, the services of a single inspector of nuisances is sufficient. To me it seems that more constant supervision, and a more minute application to the work of improvement were required. I may specially refer to the villages of Skenfrith, Lydbrook, Whitecroft, Yorkley, and Ragland, as amongst those to which attention of the kind I have spoken of is specially needed."

A NEW method of enriching ordinary burning gas has lately been introduced into this country from America. The gas treated by this process is known as the Lawrence Carburetted gas, and a company has been formed under the style of the Lawrence Automatic Gas Company (Limited), in order to work the invention commercially in this conntry. The following is briefly the method of operation. There is a rectangular receptacle, which, of course, varies with the number of lights on the installation. An example we lately inspected at the offices of the company is roughly about 2 ft. cube, and is intended for a medium-sized mill or factory. In this are perforated trays, upon which wood shavings are laid. Above the trays is a reservoir into which gasoline is introduced, and this gradually trickles down, whilst the gas ascends amongst the trays and through the shavings, and is thereby enriched by contact with the gasoline. The flow of the liquid is regulated by a ball-cock which comes into action, and shuts off the supply when a given amount has collected in the bottom of the receptacle. There is a water-seal at the top to prevent escape of vapour. No external heat is used, and in this respect the system differs, we believe, from some others of a somewbat different nature. We witnessed, a few days ago, some tests made with the apparatus, but no photometric apparatus being available, we are unable to give precise figures from our own observation. There can

be no doubt, however, that a vast improvement takes place in the illuminating power of the gas when the apparatus is applied. Dr. John Hopkinson, F.R.S., has reported to the company on the system. The following are given by him as the mean results of a large number of experiments. From his figures it would seem that a Bray No. O burner, using Lawrence gas, compares very favourably with the Bray No. 6, burning ordinary, or City, gas, the economy amounting to 40 per cent. Dr. Hopkinson also states that for the same illuminating power the heat and the products of combustion will be much less, and, consequently, the damage to decorations and health will be less than when ordinary gas is consumed. In short, Dr. Hopkinson states "the Lawrence gas realises all the advantages of paraffin lamps with the convenience of ordinary gas." Mr. A. M. Levy has also published some tests he has made with this gas, and comes to the following conclusions:—1. That the illuminating power of Lawrence gas is 8¼ times that of ordinary gas. 2. That for every foot of gas carburetted eight-tenths of an ounce of gasoline are evaporated. This quantity is reducible. 3. The saving realised, candle-power for candle-power, will vary 45 to 50 per cent. gross of the cost of illumination by City gas. 4. The Lawrence gas is less injurious to health and property than ordinary City gas. These are all valuable characteristics, and seem to point to a brilliant future for the Lawrence gas; but it of course remains to be seen how far they may be counterbalanced,—if at all,—by drawbacks which may arise in the course of practical work. The chief difficulty in systems of illumination of this character is that the carburetting apparatus is apt to clog after a time, and that trouble arises through deposition if the gas has to be carried far in the pipes after it has been enriched. It is but right to state, however, that the Lawrence system differs in essential details from those in which these difficulties have arisen. Several installations have already been made, and are said to be giving very good results. The system has been largely applied in the United States.

IN reference to an advertisement which appeared on the front page of last week's *Builder*, referring to the Royal Institute of Architects' Examination in Liverpool, to be held in February, 1889, we are asked to say that the Liverpool Architectural Society, having arranged with the Institute to hold the Examination in that city, are very desirous to make it a success. A special arrangement (subject to the names being submitted) has been made with the Liverpool Free Library for candidates to have access to the numerous architectural works there, and the Liverpool Society are prepared to offer extra facilities for the use of their own library. Professor Hele Shaw, of the Victoria University, Liverpool, has most cordially expressed his willingness to deliver a course of, say, six lectures, on "Materials" and "Strength of Materials," provided the hon. sec. for the Examination, Mr. Alfred Culshaw, can furnish him with the names of ten or more candidates who would attend. The fees for the course will be merely nominal. The proposed course of lectures will be as follows:—1. The Properties and Preservation of Timber; 2. Iron and Steel. 3. Natural and Artificial Stones and Cement; 4. The Strength of Beams; 5. Riveted Girders. 6. Iron Roof Trusses.

The Geology of the London District.—Prof. H. G. Seeley, F.R.S., is about to deliver a course of lectures on the practical study of the geology of the country round London. This course is given at the request of students of the London Geological Field Class, and information concerning it may be obtained from Mr. William Dunn, 21, King William-street, Strand, W.C.

Newsvendors' Benevolent and Provident Institution.—Mr. Edward L. Lawson, of the *Daily Telegraph*, will early in the coming year preside at the jubilee festival of this institution.

LETTER FROM PARIS.

A SERIOUS accident,—which has, however, been exaggerated by the newspapers,—happened in the Exhibition works a few days ago, when the pier to the right of the entrance to the Palais des Arts Libéraux, came down, bringing a quantity of masonry down with it. The precise responsibility for the accident is not yet determined. Otherwise, the various pavilions may now be considered finished, and the Eiffel Tower is now up to two-thirds of its height. Independently of the main pavilions, there are some subsidiary erections being raised in the Champ de Mars, of which the most important are the pavilion of the Société des Téléphones, designed by M. Ducasseau; that of the gas companies, by M. Henri Picq; the "Théâtre des Folies Parisiennes," designed by M. Masson; the palace of the Principality of Monaco, flanked by turrets, and with an immense greenhouse to it, designed by M. Janty; and the pavilions of Pastellists and Water-colour Artists, designed respectively by M. Harmant and M. Escalier.

Committees are still in process of organisation for dealing with various special and technical subjects in the Exhibition. Among these is the recently-appointed committee of the retrospective or historical exhibition of fine arts. It includes M. Kaempfen, the Director of the National Museums, MM. Etienne Arago, Gosselin, Lafenestre, Saglio, Courajod, Guillaume, Paul Mantz, Jean Gigoux, De Chennievierre, Bonnat, and Marquiset. This committee will appeal to the leading French and foreign amateurs and collectors of works of art, from whom about sixty will be chosen to form a committee of organisation, which will probably have a difficult task before it in overcoming the natural dislike of owners to part for a time with their most valued examples of art.

The design for the diploma which will be given to prize-winners in the exhibition is the subject of a competition in which about 150 artists have taken part. After long consideration, the jury have chosen the designs of MM. Louis Bonnier (architect), Henri Danger, Daniel Dupuis, Georges Duval, Victor Galland, and Michel Lançon, who will have to enter into a final competition. The designs are, it must be confessed, a very feeble set, and the Government might as well have gone to a recognised master in design at once, as in the case of the diploma of the 1878 Exhibition, which was entrusted to Baudry. It is to be feared that, in spite of this mania for competition, the diploma for 1889 will not be worthy of the occasion.

As we have already mentioned, the inauguration of Dalou's monumental group, "Le Triomphe de la République," will take place in the coming year, on the day of the National Fête, and the programme of this ceremony is already under consideration. The group, of which the *Builder* published an illustration two years ago, will be erected in the centre of the basin of the Place de la Nation, raised on three large steps; and as the principal *motif* of the composition will not lend itself to treatment as a fountain, it will be supplemented by figures of Naïads and Tritons rising from the water and directing their jets of water, as in the Neptune Fountain at Versailles, towards the monument as a centre. The sum necessary thus to "complete" the work is estimated at about 230,000 fr. Dalou's composition has been criticised lately as being too like a magnified "centre-piece," and the proposed treatment will not make it less so; but, as sculpture, it is one of the most masterly productions of French art in this century.

The model of a veritable centrepiece of unusual scale and importance has been exhibited at the Hôtel de Ville; it is a work proposed to be executed by the Maison Christofle for the Municipal banquets. The principal piece has a plateau 4½ mètres long; in the centre is the Genius of the Republic, an olive-bough in her hand, as protectress of the City of Paris, which is supported by four figures representing "L'Invention," "Le Goût," "L'Adresse," and "La Force." On the pedestal, four groups symbolise "L'Instruction," "L'Assistance Publique," "Les Travaux," and "La Securité." The side-pieces are formed by two plateaux of 3 mètres in length, in the centre of which are placed allegorical figures of the Seine and the Marne, supported by figures signifying river-side industries in the past and present (boatmen, fishermen, rowers, &c.). In addition to this purely decorative work, there are four flower-baskets, ornamented with figures symbolising the arts of metal-working, masonry, carpentry, pottery, glass-blowing, weaving, and paper-making. Then come four porcelain vases, ornamented with the attributes of the sciences, the arts, commerce, and industry. Twenty-four candelabra of very fine design, and 132 pieces of dessert service, complete the magnificent set, which has been designed by some of our most eminent sculptors, and which forms a remarkably rich and artistic *ensemble*, certainly superior to most of the work which the municipality has obtained in its numerous competitions.

Another competition with a poor result has been that for the Danton Monument, the first competition for which has been settled by the selection of the designs of MM. Desca, Lavasseur, and Auguste, Paris, who will compete for the final selection. M. Desca's design is the only one that is above commonplace, and the other two would seem to have been selected with the view of giving him an easy victory. There is to be a competition also for the decoration, by painting, of the Mairie of the XIVth Arrondissement, which is also to have the addition of a marble bust of "La République," to be executed by M. Blanchard. The Mairie at Lilas, of which the *Builder* gave an illustration on March 3 last, has escaped the competition mania, and is to be decorated with tapestries to be executed by MM. Bramtot and Vimont. This Mairie will also have its "République" bust by M. Mathurin-Moreau. The architect of the Mairie at Lilas, M. Héneux, has been chosen in competition to build a new Mairie on the wooded heights of Meudon, above Paris, and another new suburban Mairie is just inaugurated at Charenton. This latter is, in fact, a transformation of an ancient château of "La belle Gabrielle"; and the architect, M. Gravereaux, has succeeded very well in adapting an ancient building to modern uses without destroying its historic character.

The pedestal for the statue of Rousseau has been prepared in the Place du Panthéon—a very simple design in red granite by M. Formigé. It is quadrangular, on a plinth also of red marble, and on the face is engraved the inscription—

JEAN JACQUES ROUSSEAU.
28 juin, 1712—3 juillet, 1778.

A small wrought-iron grille surrounds the monument, which will shortly be inaugurated. In a few weeks there will also be inaugurated in the court of the Observatory the fine statue of Leverrier, by Chapu, which is already on its pedestal. The "Société des Gens de Lettres" has commissioned the same sculptor to execute a statue of Balzac, to be erected in Paris, and for which the State will be asked to give a site in the garden of the Palais Royal.

The "Institut Pasteur," which has just been solemnly inaugurated, has been built in the Rue Dutot, from the designs of M. Vaugirard. It is a large building of very simple design, which has, however, cost (including the site) nearly two million francs. It contains a series of large laboratories, theatres, lecture-rooms, &c., and has been very well planned for its purpose.

The municipality are continuing the restoration, by artisans from the Gobelins and Aubusson manufactories, of their splendid collection of ancient tapestries, which will be shortly exhibited to the public in the new museum at Auteuil.

In connexion with this subject, we may mention the recent publication of a large and learned work on the "Manufactures Nationales" of France, giving information which will be new to most readers in regard to the organisation of French manufactures. The book is the joint production of M. Henry Havard, member of the Conseil Supérieur des Beaux Arts, and M. Marius Vachon, well known as a critical writer on Art. The history of the Gobelins, the Savonnerie, the Sêvres manufacture, and others, has never yet been written, so that the authors have done a real service to the history of French art by their book, which comes very appropriately on the eve of the Exhibition, and gives an immense amount of curious information as to the past practice of various art manufactures in France.

Besides the "Blanc et Noir" Exhibition, there are at present open in Paris two "Expositions Particulières," one in the Georges Petit Gallery of contemporary French artists, which includes, however, only second-rate work; the other at the gallery of M. Durand Ruel, consisting of a series of works by a Russian artist, M. Makowsky, who has considerable reputation at St. Petersburg. With the exception of one historical painting, "The Death of Ivan the Terrible," these works show a practised hand rather than any power of invention or imagination An

exhibition of the works of Perrin, who, however, was rather a poet than a painter, is to take place shortly, and after that an exhibition of the works of Barye, the great animal sculptor, which is in preparation by a Committee directed by M. Bonnat and M. Guillaume. This will be held at the École des Beaux Arts, and will include the proofs *à cire perdue* of the master's principal bronzes, as well as a number of the fine studies in crayon and water-colour which he used to compose before modelling a subject.*

The Académie des Beaux Arts has elected M. Gustave Moreau as a member in the Section of Painting, to fill the vacancy left by the death of Gustave Boulanger. M. Moreau, elected by nineteen to twelve votes, was one of five candidates, the others being Jules Lefebvre, Jean Paul Laurens, Émile Lévy, and Henner.† M. Moreau, who was born in Paris in 1826, is little known to the general public. He is a painter of severe style, who works on his own line, without troubling himself about public or press renown. It is with great pleasure that we record the well-merited success of this conscientious and learned painter, to whom we owe some works in a very perfect style, such as the "Orphée décliné par les Ménades," in the Luxembourg Museum. In the section of engraving M, Blanchard has been elected to fill the place of the late M. François. M. Blanchard is also a native of Paris, and has received medals in the *Salon* of 1843 and in several years since, as well as medals at the Universal Exhibitions of 1867 and 1878. The *Journal Officiel* announces the appointment of M. Bonnat as chef d'atelier at the École des Beaux Arts, in place of Boulanger; an excellent choice in every respect.

We are still occupied about the rebuilding of the Opéra Comique. In a letter addressed to the Minister of Fine Arts, the "Société des Architectes Diplomés par le Gouvernement" has asked for a competition to be opened, as the readiest means of coming to a solution of the question. This is also the advice of the official reporter, M. Steenaekers; but the differences between the Government and the Administration des Bâtiments Civils seem likely to spin out the question for ever.

We have had a good many losses in the artistic world during the past month. Among architects, we have to record the death of M. François Rolland, one of the founders of the Société Centrale; that of M. Edmond Meffre, member of the Société Archéologique, to whom we owe some important works in the provinces, especially the building of various châteaux in Tourraine; that of M. J. Michel Dominique, Diocesan Architect and Inspecteur des "Monuments Historiques"; and that of M. Lucien Douillard, architect to the Government, who aided in the restoration of a great many ancient buildings, especially the Église Ste. Croix at Orléans, and the château de Beaugency. We have also to record the death of the decorative painter, M. Paul Rey, to whom we owe the interior ornamentation of the synagogue in the rue de la Victoire, that of the foyer of the Théâtre Lyrique, and that of a portion of the Hôtel Païva, celebrated otherwise for the paintings of Baudry which it contains. In sculpture we have lost two talented artists, Auguste Lechesne, who has died at his native town of Caen, at the age of 73, and Charles Marie Degeorge, a pupil of Duret, Hippolyte Flandrin, and Jouffroy, who has died in the full vigour of life and talent, just after the completion of his two new marble statues for the Hôtel de Ville. He obtained the Prix de Rome in 1866. He was the author of the monumental fountain erected at Lyons in honour of Hippolyte Flandrin, and of the spirited bust of Regnault which crowns the well-known monument to that artist at the École des Beaux Arts.

Obituary.—The death is recorded of Herr Franz Schmidt, the City Architect and Chief Engineer of Pesth, well known for his meritorious services in reconstructing the Hungarian capital. He shot himself in consequence of a nervous affliction. The deceased was a Freemason, member of the Municipal Council, President of the local School Board, and one of the leading men of the Academy of Music, and the Choral Union of Buda-Pesth.

* This ought to be an exhibition of great interest. Comparatively few people in England, even now, are aware of the power and grandeur of Barye's genius. He might be called the Michelangelo of animal sculpture.—ED.

† The passing over of both Lefebvre and Henner will seem a curious and rather inexplicable result to English readers, to whom the name of Moreau is certainly much less familiar.—ED.

THE ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD.

LONDON WATER SUPPLY.

THE "Seventeenth Annual Report of the Local Government Board, 1887-88," just issued,* will be looked at with additional interest just now, in view of the new Local Government Act, shortly to take effect. As in previous issues, it is divided into three sections, viz., I. "Relief of the Poor and the Poor Rate"; II. "Local Government and Public Health;" and III. "Local Taxation and Valuation." The large number of appendices which supplement the Report, and which cover nearly three times as many pages as that document, contain a great deal of useful matter interesting to all who are concerned in successful local government,—and who is not? The report is dated "June, 1888," but it must not be inferred from this that the voluminous information it embodies is all brought down to that date.

Looking at the first section of the report, that, viz., dealing with the relief of the poor and the incidence of the poor-rate, we find it recorded that on the 1st of January last the total number of paupers of all classes in England and Wales in receipt of relief was 831,353, of whom 206,134 were indoor and 625,067 out-door paupers, while 152 received both in-door and out-door relief. As compared with the state of pauperism on the 1st of January, 1887, these figures show an increase of 4,536 in-door and 4,550 out-door paupers, and an increase of 52 in the number receiving both in-door and out-door relief. The increase on the total number of paupers was thus 9,138, or 1·1 per cent. The only divisions in which there was a decrease of pauperism on the 1st of January last, as compared with the 1st of January, 1887, were the North-Western, South-Western, West Midland, and Welsh Divisions. In the first of these the decrease was 3·3 per cent., whilst in the other divisions mentioned the decrease was less than 1 per cent. The largest increase, we regret to observe, took place in the metropolis, where it amounted to 6,509, or 5·9 per cent. In the other Poor-law divisions of the country, the increase ranged from 3·9 per cent. in the North Midland to 0·2 per cent. in the York Division. "The population of England and Wales," says the Report, "as estimated by the Registrar-General, was 27,870,586 in the middle of the year 1886, and 28,247,151 in the middle of 1887. Taking these figures as the basis of calculation for the purpose of ascertaining the proportion to the population of the paupers relieved on the 1st of January of the two years 1887 and 1888, respectively, it appears that the total number of paupers on each occasion amounted approximately to 1 in every 34 persons, being about 3 per cent. of the population." Of the adult male and female paupers, by far the larger proportion, viz., 141,232 males, and 231,673 females, were not able-bodied, while those classed as able-bodied in the returns included a large number who were temporarily disabled. Summaries of the reports made to the Local Government Board by its "General Inspectors" are given in the text of the report, but they are given *in extenso* in an appendix. One of the inspectors, Mr. Henley, states that the hope expressed in his last annual report, that the prospects of the working classes in Lancashire were brightening, has not been disappointed. For about two months in the summer [of last year] it was found desirable to work short time in the Manchester cotton trade, and for nearly six months from the middle of May [1887], a strike in the Bolton iron trade is estimated to have affected nearly 2,000 hands, and to have caused a loss of 50,000*l.* in wages; but these interruptions to labour, Mr. Henley reports, caused no perceptible increase in the pauperism of the district. As to the expenditure for Poor-law purposes, the returns included in the report only come down to March 25, 1887. For the year ending with that date, the total expenditure was 8,176,768*l.*, or an average charge of 5s. 10½d. per head on the estimated population, being 2d. per head less than in the preceding year, and an average rate of 1s. 1·2d. in the pound on the rateable value of the property liable to contribute to the Poor-rate. In not one of the preceding twenty-five years, we are informed by the Report, has the average charge per head of the expenditure been less, and in every previous year for which we have statistics the average rate in the pound on the rateable value has been higher.

* London: Printed for Her Majesty's Stationery Office, by Eyre & Spottiswoode.

Turning now to the second section of the report, that relating to "Local Government and Public Health," we learn that since the constitution of the Board on its present basis in 1871, the Board has sanctioned loans to Urban and Rural Sanitary Authorities to the amount of 38,825,093*l.* By far the greater proportion of these loans has been sanctioned for the purpose of sanitary improvements in Urban Districts, to be executed under the provisions of the Sanitary Acts, the Public Health Act, 1875, and local Acts and Provisional Orders. In 1887, the loans sanctioned amounted to 2,103,026*l.*, which included 1,822,449*l.* to be expended on sanitary works in Urban Districts, 180,577*l.* in respect of sanitary improvements in Rural Districts, and 100,000*l.* for expenditure under the Artisans' and Labourers' Dwellings Improvement Act, 1875. In addition to these amounts, sanction has been given to loans to joint boards, in respect of schemes of sewerage and sewage disposal, the provision of hospitals, cemeteries, &c., to the amount of 171,235*l.* during the year 1887, making the total of loans sanctioned to joint boards since 1875 1,121,519*l.* Sanction has also been given during the year to the borrowing of 39,000*l.* by Commissioners of Baths and Washhouses in the Metropolis, 19,135*l.* by Library Authorities, and 900*l.* by a Port Sanitary Authority. The loans sanctioned to Urban Sanitary Authorities during the year for works of water-supply amounted to 174,687*l.*, while for sewerage works and sewage disposal the same Authorities received sanction to borrow 443,188*l.* Loans to Rural Sanitary Authorities were sanctioned as follows, viz., water supply, 33,265*l.*; sewerage and sewage disposal, 119,822*l.* The various "Orders" made by the Board during the year having been enumerated, mention is made of the 529 inquiries held by the Board's Engineering Inspectors, and the Report goes on to mention new legislative measures affecting Sanitary Authorities. These include the Local Government (Boundaries) Act, 1887, the Local Authorities (Expenses) Act, 1887, the Allotments Act, 1887, the Open Spaces Act, 1887, the Public Libraries Acts Amendment Act, 1887, the Quarry (Fencing) Act, 1887, the Public Works Loans Act, 1887, and the Water Companies (Regulation of Powers) Act, 1887, which prohibits the water companies to which it applies from cutting-off, for non-payment of water-rate, the water supply from any dwelling-house or part of a dwelling-house occupied as a separate tenement, in respect of which the owner and not the occupier is liable by law or by agreement with the water company to the payment of the water-rate. This Act applies to every water company which is a trading company supplying water for profit, and to which any of the provisions of the Waterworks Clauses Act, 1847, have been or are hereafter made applicable by any special Act or Provisional Order confirmed by Parliament. After describing the action of the Board with regard to private Bills, as to offences against the Rivers Pollution Prevention Act, 1876, and as to the provisions of the Artisans' and Labourers' Dwellings Improvement Act, 1875, the Report mentions that the Board confirmed during the year 424 series of By-laws framed under the Public Health Act (1875) and the Acts incorporated therewith. The Board also gave attention to 301 series of regulations made by various Sanitary Authorities under the Dairies, Cowsheds, and Milkshops Amending Order of 1886. The inspection of canal-boats, under the Canal Boats Acts, the adulteration of food and drink, and action under the Alkali, &c., Works Regulation Act, are the next subjects passed in review by the report. In regard to the last-named subject, it is stated that "deposits of alkali waste continue to be a source of complaint, particularly at Widnes, where they are already of enormous extent, and where they receive additions of something like 1,000 tons a day." "Certain processes, however," it is added, "seem to be gaining ground for treating the waste before deposit, so as to extract from it the sulphur which is at the same time its most noxious and its most valuable constituent. If these come into use a serious difficulty will be obviated."

A very important part of this second section of the Report is that referring to the water-supply of the metropolis. The reports of the examiner under the Metropolis Water Act, 1871 (Major-General A. de C. Scott, R.E.), and of the analyst (Professor Frankland, F.R.S.), on the water supplied by the eight Metropolitan Companies in 1887, are given in an appendix. "These reports show with what success the companies have coped during the year with the

increasingly difficult task of supplying a huge and growing population with water from an area constantly exposed to fresh pollutions." Professor Frankland states that the water from both the Thames and Lea, as supplied to consumers in 1887, contained a smaller average amount of organic matter than in any year since the present system of analysis was begun in 1868. "This result is no doubt in great part due," says the Report, "to the fact that the aggregate rainfall of 1887 was exceedingly small, and especially to the almost entire absence of floods. The river-water, therefore, instead of receiving a large amount of decaying vegetation, of the washings from manured fields, and, as often happens in times of flood, of the overflows of cesspools and the soakings of other accumulations of filth, was mainly derived from springs, and had thus undergone a process of natural filtration."

A serious note of warning as to the possible inadequacy of the metropolitan water supply at no distant date is suggested by the report of General Scott. Referring to this, the Report of the Board says:—

"With regard to the quantity of water now supplied, and in future available for distribution by the respective companies, General Scott's report furnishes some interesting particulars. Of the eight companies, the Chelsea, the Grand Junction, the Lambeth, the Southwark & Vauxhall, and the West Middlesex, derive their water from the Thames. The New River Company takes its supply from the River Lea, near Ware, from Chadwell Spring, and from wells in the Lea Valley; the East London Company has its chief intake in the Lea at Chingford, has two wells sunk into the chalk in the Lea Valley, and supplements the supply from these sources with Thames water obtained at Sunbury; while the Kent Company relies exclusively on wells sunk into the chalk. Together, these companies supply a population of about five-and-a-half millions, of whom rather over two millions and a-half are within the New River and East London districts. Roughly speaking, rather over half the whole supply is from the Thames, about one-third from the Lea, and one-eighth from springs, wells, and ponds. The average daily supply for domestic purposes in 1887 was 131,041,471 gallons, being rather over 24 gallons per head of the population. For non-domestic purposes (*e.g.* for manufactories, street watering &c.) the daily amount was 32,760,471 gallons. In 1887, 104,504 more persons were supplied than in 1886, and of these, nearly one-third were in the district of the East London Company. Having regard to the steady increase in the demand, it becomes a matter for serious consideration whether this company, without extensive additions to its present supply, will be able to meet the requirements of its district in the course of a few years, in the event of there being any long-continued droughts. General Scott thinks it possible that in 1892, assuming the summer to be hot and dry, the company may be called upon to supply a maximum of no less than 52,000,000 gallons a day, of which they are authorised to take only 10,000,000 from the Thames, and he points out that in the dry summer and autumn of 1874 it was estimated that the flow of water at Fielde's Weir, in the Lea, above the intake of the Company, was only between 15,000,000 and 16,000,000 gallons daily. If a similar scarcity should recur, it seems very doubtful whether the Company, though it has very large reservoirs, would be able, without resorting to fresh sources of supply, to satisfy the demands upon it, and, even if its pumping power were largely augmented and fresh wells were sunk, it is by no means certain that a sufficient amount of water could be abstracted from the chalk strata in the Valley of the Lea without, to some extent, depleting that river. Indeed, it may be doubted whether the Lea can in any case be relied upon to furnish continuously the same amount of water as has recently been taken from it; and we cannot regard without anxiety the possibility of a failure of adequate supply in the populous districts which now obtain their water chiefly from that source."

The East London is not the only company whose supply is likely to run short in the near future. It is pointed out in the Report that the Lambeth Waterworks Company, without further powers, can scarcely expect to be able to cope with an annual addition of between 15,000 and 25,000 persons to their present consumers. To quote again from the Report:—

"General Scott gives his reasons for thinking it possible that in 1892 the maximum daily demand may exceed, by about 24,000,000 gallons, the maximum daily supply furnished in 1887. If this should actually happen, the amount would reach 224,000,000 gallons, or more than two-thirds of the utmost quantity which, according to the estimate of the Royal Commission of 1867, could be reasonably expected to be obtained for the use of the metropolis from the whole of the Thames basin between the source of the river and the sea. It would seem, therefore, that at no very distant period, the margin between supply and demand may become perilously small; and that, at any rate in the case of some of the companies, the question how the existing sources can be supplemented from others outside the watersheds of the Thames and Lea is one of which the consideration cannot be long deferred."

It will therefore be one of the first duties of the forthcoming London County Council, we apprehend, to take the subject of London's water-supply into its consideration. It is gratifying to find that the adoption of the "constant supply" system has made considerable progress, and that about 51 per cent. of the whole number of houses in the metropolis are now supplied on that system. An interesting explanation is given of the cause of the presence of eels in the water-pipes of the East London Company, reported two years ago. It is asserted that eels are never known to spawn except in salt or brackish water; that the eels, in descending from the Lea to the estuary of the Thames for that purpose, frequently leave the water, and cross any damp land that offers itself. One of the reservoirs of the East London Company is partly encircled by the River Lea; and it is concluded, as the result of a careful inquiry and examination by General Scott and Mr. W. H. Power (one of the members of the Medical Staff of the Board) that the eels going down the River Lea had left it at that point, possibly to avoid the foulness of its lower waters; the same route, it is argued, would be taken by the eels and elvers on their return from the sea to the river, and that, in crossing the gently-sloping turf which covered the reservoir, some of them had dropped down into the water through the apertures left for ventilation, and had subsequently made their way to the taps of the consumers. The company having closed the openings of the ventilators in question it is stated that all complaints of eels in the mains have ceased.

As to the third section of the Report, "Local Taxation and Valuation," we have no space to go into an analysis of the statistics therein given, and we can only say, in conclusion, that the study of this Report, with its valuable appendices, will be found to be the indispensable duty of every member of the new County Councils.

THE ARTS AND CRAFTS EXHIBITION SOCIETY.

BOOKBINDING.

It is seldom that the trust of the lectured is so well rewarded as it was on the evening of the 22nd ult., when a delighted and crowded audience listened to Mr. Cobden-Sanderson's eloquent address on the craft of the bookbinder.

The syllabus issued by the above society states the object of the current course of lectures to be a desire to familiarise the public with the actual processes involved in the pursuit of certain arts and crafts. But the names of some of the moving spirits in the affair suggest a deeper purpose, which Mr. Cobden-Sanderson's address frankly disclosed, dealing, as it did, from the standpoint of philosophic socialism, with the economic conditions affecting the artist and the craftsman, the amelioration of whose position we all desire.

The task of giving expression to this desire could not have been entrusted to abler hands. The discourse, which lasted an hour and three-quarters, was perfect in form and delivery, and, if we except the conventional girds at the man in the black coat, and that still more abandoned character, the capitalist, in excellent taste. Its literary standard was uniformly high, abounding in felicitous phrases, which were enforced with an earnest and persuasive eloquence.

The lecturer has taken up the craft of the bookbinder from the highest motives, and has acquired a complete mastery over all its details. The galleries contain specimens of his work which attest his skill and his refined artistic taste, and his name is well-known to all lovers of sumptuously-bound books.

After an exordium, in which the lecturer sketched the history of the craft from the days of papyrus rolls to the present, and dwelt upon the aims which should actuate the binder, he treated the audience to an effective little dramatic scene. Craving permission, he took off his coat, and donned with calculated *empressement* what he hoped would prove the "banner of the future,"—a workman's apron; in doing so he fairly "brought down the house," placing himself *en rapport* with the sympathies of his audience.

Thus accoutred, he plunged into the business of the evening, and demonstrated with the utmost neatness and precision, by the aid of books in various stages of binding, and by copious illustrations on the blackboard, the whole art and mystery of bookbinding as practised by himself, folding the sheets, sewing them, putting on the boards, and covering them with leather.

Anxious to press on to the "really interesting points," he said little or nothing as to the tooling and decoration of the covers, or the designs most suitable for their embellishment,—drawing a bill upon Mr. Walter Crane, whose lecture is to complete the series, and will deal fully with this side of the subject.

The "really interesting points" turned out to be the artistic and social losses which result from the present subdivision of labour in this and other crafts. The lecturer enumerated the various "hands" through which a modern book passes after leaving the printers,—from the woman who sews the sheets to the "gentleman who sits apart and taps his forehead for appropriate designs" wherewith to decorate its covers. Labour so subdivided loses all its joyfulness, and the endless repetition of one operation becomes drudgery. Variety of occupation brings relief to the craftsman, and throws a charm over all his work. Moreover, it is but bare justice to reward the man who has pasted the boards by the enjoyment of decorating them. This higher duty would give him strength and rest, and he would return to the more mechanical operations with renewed interest and vigour.

But the lecturer would go even further than this,—much further. "There is," he said, "something incongruous, not to say gross, in the notion of offering a book to be bound and made beautiful for its own beauty's sake to a man who knows nothing about that beauty—nothing about its author; to a man who will give the book back bound as ignorant of both as when he received it; and yet he will have decorated it! I say, then, the binder must be an educated man, sensitive to the high beauty of what is beautiful in literature, conversant with it, and apt, as craftsman, to give imaginative expression to his enthusiasm."

It would seem to follow that the binder should not only make his own paste, as Mr. Cobden-Sanderson does, and design his own covers, as Mr. Cobden-Sanderson does, but also possess his learning and general culture. He should, in fact, be a Mathew Arnold in an apron appraising with unerring critical insight the literary treasures to which his craft gives suitable and permanent protection. But why stop there? Why not write the book, as well as print it, illustrate it, bind it, and all? Where can the line be drawn?

Machinery in any form as applied to the craft, Mr. Cobden-Sanderson would, if we understand him aright, abolish. Like Mr. Ruskin, he is wroth with anything and everything which interferes with the evidence of human handiwork, of human success, and even of human error. In Paris he saw a binder engaged in reproducing old designs with the irregular spacing rectified by square and compass, to the lecturer's inexpressible grief. A book, he said, is the production of a human being, for a human being, and should have the marks of humanity about it. Every book should have its own individuality, and be treated *per se*. Mr. Cobden-Sanderson spends much time and pains in selecting from amongst the stocks of various manufacturers a skin suitable for his purpose, and having found it, he, for ever so small a book, cuts out the very choicest part. In order that it may be folded evenly over the edges of the boards, he spends six hours in paring the margins. Six hours of happy labour,—his well-filled mind revelling the while in the images of beauty with which it is stored.

This is indeed Royal work, fit for the Court of a Francis I., a Henry II. and his book-loving paramour. Of course, it opens up the whole question of the distribution of labour,—whether, in fact, it is not on the whole better that the sewing woman should sew and the gentleman who "taps his forehead" go on tapping rather than make his hands sticky with paste or shaky with hammering.

In the press and hurry of this crowded world these questions have answered themselves, and the other numerous economic questions upon which Mr. Cobden-Sanderson dwelt will work out their own solution in due time; we cannot see in the near future the solution for which he longs, when there shall be no poverty in the world, but all shall be equally free, cultured,

virtuous, and happy. It is a dream which will we fear never be realised. Meanwhile, he and those who work with him to this end deserve our thanks, and we thank him also for his personal efforts towards the resuscitation and advancement of a beautiful art.

THE AFFILIATION OF STUDENT ARCHITECTURAL SOCIETIES.*

The sole aim and object of the Architectural Association in the affiliation of all architectural student societies with its own body is to form a strong bond of union between them, so that they may be able to give a weighty expression of opinion on all matters connected with architectural education, both as to the best methods to be pursued in acquiring knowledge, and the most satisfactory means of testing the quality of the knowledge thus acquired.

As the Institute Examination is yearly increasing in importance, and will be shortly recognised by Royal Charter, we hope that eventually it will be obligatory on all practising architects. Its value to students cannot be exaggerated, and it is therefore of vital importance to them that they should have an opportunity of collectively expressing an opinion on any changes that may be proposed in the methods of conducting the Examination. There are two evils that can befall it, and both of which it is to the interest of the student societies to guard it against by insisting, firstly, that the standard of efficiency shall not be lowered; and, secondly, that the Examination shall encourage the study of architecture as a living art and the acquisition of sound practical knowledge, avoiding the evils of superficial information hastily crammed for the purpose of passing the Examination, and forgotten as quickly as it was acquired.

As by the new Charter the Architectural Association will have a representative on the Council of the Royal Institute of British Architects, who will be the recognised representative of the student societies, it is of very great importance that he should be in close touch with as large a body of students as possible, and have every facility of ascertaining the views of his constituency, especially in connexion with the obligatory Examination.

It is in contemplation to make considerable modifications in the method of conducting this Examination, probably by dividing it up into three examinations, which will be held at provincial centres as well as in London; the position of these centres is a matter of importance on which the expression of the student societies should be obtained. The greater frequency of the examinations and the preparation of the necessary drawings to be submitted as testimonies of study would give an object and a direction to the work of the Classes of the student societies which they have not at present.

These societies should afford facilities for preparation for these examinations, and as they are in the position to induce their members to come up for examination, I hope that a healthy rivalry may be established among them as to which shall produce the greatest number of passes.

The advantage of contact with men interested in the same pursuits as one's self is, in my mind, the greatest advantage to be derived from our student associations, and the more opportunities that can be afforded for these meetings the better.

Most of the objections that have been raised to our scheme arise from the want of *esprit de corps* among the provincial members of our profession; this, I think, is caused by a lack of opportunities for mutual intercourse, and by the isolated way in which provincial practices are carried on. If, through our affiliation scheme, we could be the means of bringing the architects of the future together to discuss matters affecting their profession, they would soon begin to take a larger view of it, and, by mutual criticism and advice, do wonders in advancing the art.

The formation of student associations in all large towns in the United Kingdom is, I am convinced, only a matter of time; but it is a difficult matter to know how to afford those students who are placed in the smaller towns, where the number of students is not sufficiently large to allow a society being successfully carried on, the facilities for study that they must have in order to compete successfully with their more fortunate brethren in the larger towns. I think it would be a good subject for discussion whether these men could derive more benefit from belonging as country members to the metropolitan or the provincial associations. I, personally, am in favour of their joining the provincial societies, and thus forming local centres through which they are more likely to be kept in touch with the working of the Classes than through the parent Association. In a complete scheme of affiliation I should like to see all the United Kingdom mapped out into districts, with a recognised association of students for each district, to which it should be as absolutely necessary to belong as for the student to have passed through some school for his ordinary education. With the increased competition in our profession I am quite sure that it is only by systematising our methods of study that the architects of the future will be able to hold their own.

The new form of articles of pupilage recently issued by the Institute* provides for the pupils attending lectures and classes of instruction. I am well aware that there exists in the smaller towns a dislike for the pupils and assistants of architects meeting, the idea being that the competition for the limited amount of work would be increased by the students comparing notes as to the work being done in their respective offices. I think that this mistrust is not well-founded, speaking from a fairly long experience in the Architectural Association. The men there do not talk about their office work; they are all too busy with their own ideas and studies, and there is at the same time a loyal desire on their part to support the dignity of the office they belong to.

Leaving the broad principles of the value of this union, let us now for a few minutes consider the value to the individual societies of connexion with a central body. In discussing this question with the Birmingham Architectural Association, I am quite sure of obtaining a favourable response. The connexion between the two societies has, I am convinced, been of mutual benefit, and I hope that, as the senior affiliated society, the Birmingham branch of the Architectural Association may develop and increase the scope of usefulness which it has already so well sustained. But though the connexion between the two societies has been successful, it by no means follows that there is no room for improvement; and I hope, after your discussion, to take back with me several valuable suggestions for the further development of our scheme; and now, if you will allow me, I will discuss a few points of detail.

The members of affiliated societies would have the following advantages, viz., the use of the loan library, the number of books being regulated by the number of members in the society, and the subscription paid; the power to join all of the Classes, and to attend the ordinary meetings, visits, and excursions. On a member migrating to the metropolis, his connexion with the provincial society would enable him, by showing his receipt for the subscription to the society for the current session, to enjoy all the privileges of ordinary members of the parent society, except that of voting.

At the end of the session, these privileges would lapse, and he would then, if he desired to continue to enjoy the advantages of the Association, have to be elected as an ordinary member. In that event it would be well if the provincial society made some arrangement for retaining him as a member on some nominal subscription. This scheme for the migration of members should also hold good for the provincial society, so that in the event of a member of the metropolitan Association coming to the provincial society, he might join on the same conditions as stated above for the parent society.

The question of migration has been an open one for some time, and it is hoped that the solution here given will be approved as a fair adjustment of the difficulty.

With regard to the inter-working of the Classes as they have done up to the present time, it will be obvious that, if the affiliation includes all the student societies, some modification of the present arrangement will have to be made, and I think that the best method to adopt will be for the whole of the Class-work to be sent up to London, and then equal parcels made of it to divide amongst the provincial societies. Of course, in that case, the work of each society should be criticised before being sent to London, and the work sent down from London, which should not contain the work the particular society had sent in, would give an opportunity for the students to see how the other provincial societies did their work. I hope I make this plain. What I mean is that the affiliation scheme will not only bring the provincial societies into touch with the metropolitan society, but also with one another. The good work that is done by our provincial brethren will thus have a wider influence.

The necessity for preparing special drawings for the Institute Examinations will no doubt modify the working of some of the Classes; but as the revised system of conducting these examinations is not yet before the public, I am not at liberty to enlarge more on this subject.

The next question to consider is whether it would be possible to arrange for the repetition of some of the courses of lectures that are delivered at the Association, and which are amongst the most popular of all its branches of work. I have but little doubt that, should the provincial societies show any desire for this, arrangements could be made for some of these lectures to be delivered on payment of little more than the travelling expenses, so that it resolves itself into a question of fees, and I think that the time has come when the students of architecture must be prepared to pay a little more for their education than they have done in the past.

The publications of the Association, "The Sketch-book," and "A.A. Notes," are open to all the provincial societies, and we should welcome subscribers and contributions from them. In connexion with the "A. A. Notes" the provincial societies could do great service by making it the recognised official organ of architectural students. They could also greatly assist us by helping forward the Sketching Club Scheme, which has for its object the organisation of a complete system of advisers to students on sketching tours,—the idea being suggested by the success of the Cyclist Touring Club,—and the collection and formation of a complete list of the buildings of architectural interest in the United Kingdom. We have started our index of such buildings, and if we could have the increased support which all the student societies could give us, we should issue the parts in greater numbers. At present we are only able to give one sheet a month. In calling your attention to this scheme, I feel that it is intimately connected with the subject under consideration, because the cordial intercommunication of such information as we seek to obtain will be one of the best means of cultivating that *esprit de corps* which is one of the principal objects of our scheme.

In addition to this index of buildings, we also seek to form a collection of measured drawings of all the examples of old work that are of value for study, and as a record of what is so quickly passing away, owing to natural decay and reckless destruction, either by entire removal, or, what is often almost worse, complete restoration.

If the provincial societies would each make themselves responsible for the old work in their immediate neighbourhood, and, by a systematic effort, secure measured drawings of all that is worth preserving, it would help in advancing our project, and also be of great benefit to the provincial society, as it would be the means of forming a most interesting collection, and also of preserving and bringing out those slight characteristics or local features which are of so much advantage in making the design in harmony with its surroundings. The extension of the use of our loan library will doubtless be a great benefit to students who have not the command of books, either of their own or belonging to the office in which they work, and it would be necessary to increase the number of the lent books in our library from time to time. As the influence of the Examination extends, I am afraid our library, excellent as it is, will, however, hardly be able to keep pace with the demands, and I should strongly urge all the provincial societies, where they have free libraries in their towns, to bring whatever influence they can to bear on the authorities to have the principal books recommended by the Institute for study placed on their shelves.

As a training to a proper study of books, I would recommend the formation of Correspondence Classes, which have been successfully worked in the following way:—

A list of books recommended for study by those preparing for the Examination

* A paper by Mr. Herbert D. Appleton, F.R.I.B.A., President of the (London) Architectural Association. Read before the Birmingham Architectural Association on the 20th ult., as briefly mentioned in our last.

* Printed in the *Builder* for Nov. 17, p. 359, *ante*.

is circulated amongst those who have agreed to form the Class, and certain books are allotted to each student, who prepares a careful digest of the book, illustrating it with marginal sketches of buildings, either from actual works or illustrations,—the peculiar features of the illustrations being explained in notes attached to them. A fortnight or three weeks is allowed each student for the preparation of the digest, and it is then sent round to the other members of the Class, who have themselves prepared digests of other books, any additional information in the way of note or sketch being added by each student in turn; and thus, by a systematic arrangement of carefully-prepared notes, a mass of useful information is gradually accumulated, and, being properly indexed, is always available for reference or study. The value of working in association in this manner is manifest. Each student in turn gets the benefit of the others' reading, or receives hints and information as to the contents of books of which he otherwise would have no idea; but the principal object is the training in a methodical habit of reading and note-taking, which will be found, when once acquired, to be of great service in impressing facts on the memory. These notes should all be sent to the secretary of the Class to be put in circulation. I have dwelt somewhat at length on these Correspondence Classes, as I believe they have not hitherto been a feature in the work of your society, and I believe they would form a very valuable one if properly carried on. The Correspondence Classes are especially suited for those country members who are unable to attend the Classes, and the difficulty of reaching whom I have referred to in the earlier part of this paper.

The study of modern architecture, which I ventured to advocate in my address to the Architectural Association,* is the last feature I would refer to. Whether the scheme that I put forward will come to anything or not I am at present unable to say, but, nevertheless, I hope that some method for the study of the excellent work that is being done all around us may be found. We cannot help studying and being influenced by this work, say what we will. It must appeal to us in a way the old examples that we know so well cannot do, and in order to do this we must train our critical powers to be able to appreciate what is good and to avoid what is bad. The excellent work of the past is the alphabet that we all must study and learn if we would spell out anything worthy of the age we live in, but old work itself cannot be adapted to modern requirements by simply eprodncing it line for line. It was executed for purposes for which we have little sympathy, and by men whose motives we cannot hope to appreciate. If we are to take part in the advancement of our art we must place ourselves abreast of the times, and the only way to do this is to give up the isolation we have observed in the past, and by united effort join hands to work towards one common end. If we succeed in forming an annual exhibition of architectural works in London, I see no reason why this collection should not be sent down for exhibition in the provinces after the London exhibition is closed.

It is in no selfish spirit that I advocate the closing-up of our ranks. It is with no intention of keeping out any who have the ability to do the work, neither is it with a view to protect the sacred principle of 5 per cent., for I believe that good, honest work will always be able to command good, honest pay. But it is in the hope that with a united front we may convince the public that our art is worthy of a high place in their regard. It is with a strong belief that by better acquaintance with our brethren we may cultivate a professional spirit that will, by its influence on individuals, raise the tone of those practising as architects; and as the honour of the profession is, after all, in the hands of its individual practitioners, the public will come to recognise that the benefits that accrue from this union are for the public weal.

A discussion afterwards took place, and a vote of thanks was passed to Mr. Appleton.

"F.S.A."—In reference to a letter from the Secretary of the Society of Antiquaries in our last, we received a letter from Mr. Binyon, too late for last week's paper, explaining that he had been under the impression that he had a right to use that affix as a member of the Society of Arts.

* See *Builder*, p. 301, *ante*.

The National Monument to General Gordon, Trafalgar-square.
Mr. Hamo Thornycroft, R.A., Sculptor.

Illustrations.

NATIONAL MONUMENT TO GENERAL GORDON.

We give illustrations of the central figure, and the two bas-relief panels of this monument, recently erected in Trafalgar-square, and of which Mr. Hamo Thornycroft is the sculptor. We have already commented on the fine quality of the work, and it is satisfactory that a monument to such a man as Gordon, however inadequate in scale and importance, should at least be characterised by high artistic feeling, and simplicity and severity of style.

The feeling in favour of realistic treatment of portrait figures in the present day, which in the main is no doubt right, throws nevertheless increased difficulties in the way of the sculptor, from an artistic point of view. The dress of the principal figure in this case is eminently unsculpturesque, but this will be pardoned if we are assured that it is a truthful representation of our lost hero in his habit as he lived. Mr. Thornycroft's idea seems to have been to give the realistic element in the portrait figure, and to raise the monument to the region of the ideal by the symbolical bas-reliefs. A similar idea seems to have governed the design of Mr. Gilbert's charming monument to Fawcett in Westminster Abbey, which we illustrated some time ago; and this is perhaps the best course which a sculptor can take when called upon to design a monument to a man of modern days.

We append also a small view of the monument as a whole.

BOARD SCHOOL, GOODRICH-ROAD.

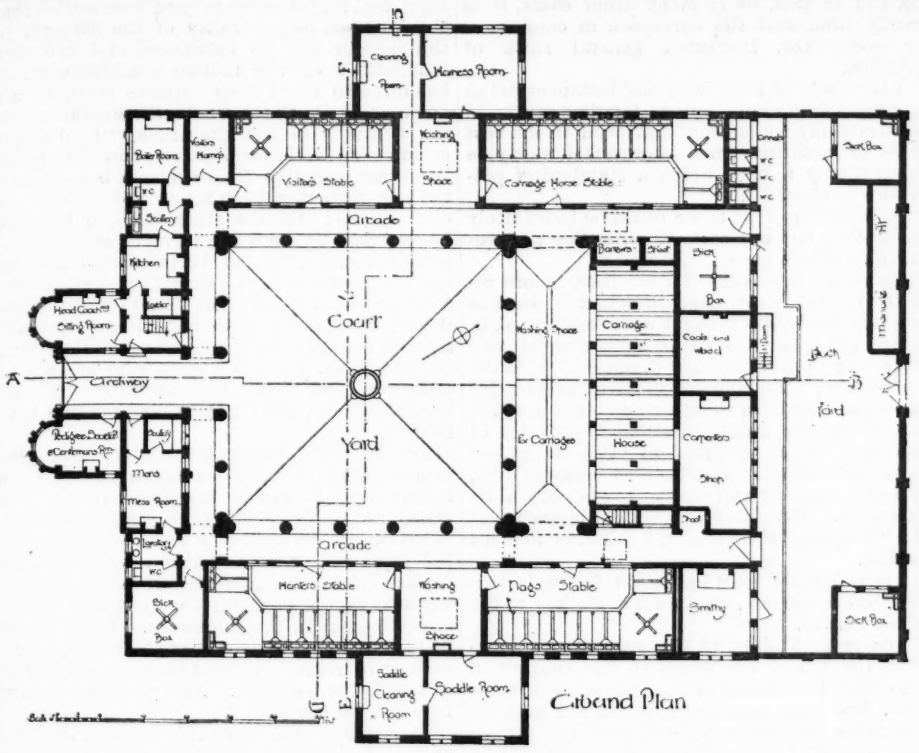
The Board School in Goodrich-road, East Dulwich, was erected in 1886 for 1,600 scholars, at an inclusive cost of 17,410*l*. The illustration (reproduced from the drawing which was hung in the Royal Academy) shows the boys' and girls' schools in two stories, with the infants' school as a separate block. The plan is very much on the lines of the Lavender-hill School, having nine class-rooms and a hall on each floor, with drawing class-room over the halls lighted from the north. This school, also, has a cookery centre attached. The architect is Mr. T. J. Bailey, Architect to the Board.

ASCOTT HOUSE, LEIGHTON BUZZARD.

This was originally a small half-timbered house of the early part of the seventeenth century. The illustrations show the recent additions made by Messrs. Williams, West, & Slade, architects. Messrs. Cubitt & Co. were the builders, and Mr. Thomas Lee the clerk of works.

DESIGN FOR STABLING FOR A COUNTRY MANSION.

The design illustrated was awarded the Architectural Association Medal this year. One of the points to be observed was that the buildings were to be placed round a quadrangle. The method adopted has been to keep the service part of the stable in a separate yard at the back, which has also a separate entrance. The men's bedrooms are on the first floor over the carriage-house. The hay and corn lofts are over the carpenter's shop, coals and wood, &c., and there is a hoist as shown, and two "shoots" (shown on plan) for serving the two lines of stables. The washing spaces are arranged centrally on each side. The plan given is a tracing made from the more complete original for photo-lithographic purposes. The materials



Design for Stabling for a Country Mansion.—By Mr. B. F. Fletcher.—Plan.

proposed to be used in the construction were red Ruabon bricks and stone, and green Westmoreland slates. There was a ½ in. detail of part of the entrance front, a first-floor plan, and a perspective sketch, which are not published. B. F. F.

"QUANTITIES:"

INSTITUTE OF BUILDERS.

AT a meeting of the Institute of Builders, held at its offices, Bedford-street, Strand, on the 22nd ult., Mr. Thos. F. Rider in the chair,

Mr. H. T. Ashby (of the firm of Ashby Bros.) read a paper on the "Quantities" question, in the course of which he said:—

It is not my purpose to enter into the history of quantities, nor to trace how they have become the important factor in the constructive trades that they are and have been for many years, although this branch of the subject would be a most interesting one,—a subject which I hope to hear treated by one of our surveyor friends.

My chief object is to initiate a discussion upon points which often occupy the thoughts of both builders and surveyors,—matters which involve much that concerns the future pleasant relations of those two bodies, as well as the interests of those who employ both.

I approach the subject in an entirely friendly way; for while standing here as a member of the Institute of Builders, interested in all that affects the great trade it represents, I can look back with great pleasure upon the many years I spent as a member of that honourable body, the quantity surveyors of London, among whom I made and retain many friends.

Quantities of some kind must have existed with the beginning of contracting, but our complex civilisation, with its subdivision of all kinds of labour, has largely relieved the contractor of the burden of measuring and calculating the well-nigh endless items that go to make up an important building. This is now done in many cases far better than it would be or could be done in most builders' offices.

In the great advance which has taken place in the constructive arts, architecture undoubtedly has shared largely. Design has greatly improved. Execution has also greatly advanced, both as to appliances and skill, as evidenced by the celerity and certainty with which substantial work is now done. But a doubt exists whether quantities have kept pace with the calls made upon them.

In the times of our fathers and grandsires, most buildings partook of the brick box type. In those days everything was of a stereotyped kind. One building was so much a counterpart of another, that it was more a matter of quantity than of description. The doors and windows, the stonework and walls, the porticoes and pediments, the mouldings and finishings, all had such a family likeness that little skill was required in either preparing or reading a bill of quantities. In those simple days, when "Classical" architecture, with its fixed types and ever-recurring details, held its own, very little originality was tolerated, and all was plain sailing. But now, many an architect thinks he has done less than his duty if any part of a building designed by him contains any great resemblance to the works even he has designed before, much less a likeness to another's work. I freely admit that this makes the work of a quantity surveyor more difficult, but this applies also to the architect and the builder, and that which is grappled with by one should be by the other. Is this so?

I am not here to treat this matter weakly, or to extenuate that which I believe to be wrong, and I therefore say boldly that too large a proportion of the bills of quantities that have passed through my hands for many years have been unworthy specimens, faulty in design, slovenly in execution, and bearing throughout an evident intention to shirk responsibility. This last defect is the cardinal sin, for its influence is seen throughout the entire work, giving obscurity of description instead of the utmost clearness, and sweeping items, couched in the most general language, in place of carefully separated measurements; and such bills of quantities always conclude with the heaviest percentage as surveyors' fees, coupled with the charges for writing or lithography in inverse proportion to the quality of the execution.

Now all this is indicative of the incompetent man. But are not these indications of incompetency far too frequent?

Now, with regard to the utterly bad productions of the so-called quantity surveyor, the only treatment that can be safely recommended is to let severely them alone, return them to those who send them, or, better still, end their mischievous existence by putting them in the fire, and then join in the agitation for altering the law of libel, which now prohibits a wide advertisement of the demerits of the authors of such trash.

Now, this evening's discussion would, I think, be unprofitable if it be not practical; and, to promote discussion and criticism, I will descend from the general to the particular. I propose to deal with three points:—

1. That the surveyor should be a thoroughly trained and competent man.

2. That the quantities should contain the clearest possible description and measurement of everything to finish the proposed building, and an exhaustive forecast of every process in the execution of the work.

3. That the responsibility of the surveyor for the correctness of the quantities be asserted beyond question or dispute.

Let us examine the case as affected by the first article of faith.

Are the majority of surveyors either trained or competent?

I say, unhesitatingly, no; the work before referred to proves this. It is not every man who could possibly be made into a good quantity surveyor, and very few who could become of the first rank.

He must naturally be a man of considerable grasp of mind, great quickness of perception, possess a tenacious memory, great order of thought and power of organisation and concentration, and be a man of decision. These natural gifts must be dominated by rigid integrity. It is necessary that he be able to deal with the work immediately under his notice, to the exclusion of all other matters, and yet be able to take up any point of his various jobs as though he had never laid it down,—that he should be able to answer almost any question, and certainly to be able to readily lay his finger upon any detail required throughout all the quantities of works in progress.

This may seem exacting, but, I am glad to know, not nearly so much so as it sounds.

The quantity surveyor should be able thoroughly to hold his own position without fear or favour, and to consider himself to be the custodian of the interests of the builder quite as much as of those of the owner. These qualifications are not of my own imagining, but those possessed by surveyors I know.

Now, having got a promising young man, what is the best curriculum to ensure his thorough training?

I have not sufficient presumption to prescribe this in anything like detail; but I may be allowed to hint that it should be decidedly more practical than academic; it should savour more of deal shavings than pencil chippings; the boots of the student should be more soiled with mortar than his fingers with ink; he should know more about a two-foot rule, at first, than an ivory scale; he should know more about bench, banker, trowel, and forge, for the early part of his training, than he should about dimensions and abstract-paper, scale and dividers. I would rather he should drive a plane than a pen, and that he should know the bond of brickwork rather than the mysteries of ruled paper; that he should learn the actual practical work of a building before he presumes to instruct a builder what he has to do by means of a bill of quantities.

This is, in my opinion, the reason why some of our best quantity surveyors occupy the position they do; although they were not in their youth formally dedicated to the profession they adorn, they have *grown* into their practice by sheer force of character and attainments, by practical training in the builders' workshops, and through a builders' office. And yet I have sometimes heard these gentlemen called untrained surveyors because, forsooth, they have not graduated through an architect's or surveyor's office!

By the foregoing remarks, I do not wish in any way to disparage the best office training. This I consider quite as important as that on the works. But office training will never fit a man for the stress and strain of "extras and omissions" and disputed work on the building; and we all know how vital this branch is. A surveyor, to hold his own in this, must know, when measuring or valuing hidden work, how this work should have been done, guided, perhaps, by very obscure evidence from a stupid or forgetful foreman, and trammelled oft-times by unfair representations from both sides, and, thus hampered, decide accurately points that none but a practical man, who has seen kindred work done, could decide.

This is a serious aspect of the question. Loss, often ruin, has befallen the man who has been misled or induced to persevere in litigation by the advice of an unpractical surveyor.

When a set of drawings has passed through the hands of a competent surveyor, the sense of security and confidence felt in them by both architect and builder is greatly strengthened. For in the careful preparation of quantities from them, weak places are almost sure to be detected.

How amazing, therefore, is it, from this point of view alone, that architects should so often entrust the quantities to incompetent men! More astonishing still is it that they have them taken out in their own offices.

This latter course cannot be too much condemned. Many architects have had their reputations seriously impaired by both the above courses, and when difficulties have arisen,—and they continually arise,—by the last proceeding, the architect is liable to imputations damaging in the highest degree.

The serious consequences to all concerned,—to architects, builders, and owners,—from the misdeeds and shortcomings of the sham or quack surveyor, are too notorious for comment here. But what efficient professional body is there to call them to account? For they flourish like rank weeds, with no one to root them out.

What test examination is there? What diploma or certificate of fitness? What watchful body with power to maintain a high standard of conduct and procedure, to investigate misdeeds, to purge the profession of black sheep?

While physicians, surgeons, even dentists, are eagerly raising their standards of efficiency and purity year by year,—when even plumbers are submitting themselves voluntarily for examination and are seeking certificates of proficiency,—should surveyors be less anxious?

I am confident our surveyors would be equally benefitted, raised, and sustained in their career if they had the support and stamp of a strong and able central body to lean upon.

There must be strength, control, and organisation to ensure healthy vitality in any body.

In dealing with the second proposition, that the quantities should contain the clearest possible description and measurement of everything to finish the proposed work, and an exhaustive forecast of every process in its execution, I shall proceed by a very few illustrations of "how not to do it."

Among the "general items" at the commencement of a bill we rarely find a description of the site and its surroundings, the means of access, and, if in the country, the nearest railway-station, village, or town.

If in London, although "making good to all adjoining property" is rarely absent, no hint or description is given of what these surroundings are, nor the distance or depth of nearest gas and water pipes or sewers.

District surveyors' fees are inserted, but the area and number of stories are rarely given.

The answer to these and other objections may be that the estimator can get all these particulars from the site and from the drawings. Quite so. He could take out the whole of the quantities by the same rule. But I hold very strongly that all these and every other information, in the fullest detail, should be given.

With reference to the measured items, there is great need of a uniform standard.

Excavation is sometimes given, "including all planking, shoring, and strutting;" sometimes, when the latter is measured separately, no indication is given of the width or depth of trenches, or whether the digging is in piers,—all points influencing greatly the value of the work.

Then, in measuring brickwork, the time-honoured method is to lump it altogether, utterly ignoring the number of piers, the frequency of openings, and the height of the various walls, except, perhaps, in factory chimney-shafts.

It always seems inconsistent to me to scrupulously measure such items as quirks and arrises to plastering, and yet altogether to ignore the greater value of reveals of openings, angles of piers, quoins, and all work that requires careful plumbing in brickwork,—items which absolutely control the value of the labour to a rod of brickwork. These items are absent unless they occur in cut or rubbed work, and then are sometimes missing, unless they are to irregular angles.

The only instance I am aware of of any attempt to grapple with this is the practice of a well-known surveyor, who, in his bricklayer's bill, has an item of so many rods of "openings," thus giving a rough idea of the open spaces, but this does not indicate the lengths of walls between the plumbing points, nor how many piers and projections there are.

The various heights to which stone has to be hoisted are always indicated in separate items in good bills of quantities, but in the same bills a like separation of heights in brickwork does not show itself, although the height to which the roof-trusses are to be fixed may be shown.

You will see I am here not advocating any reforms beyond those indicated by lines already existing within the bills.

Why should some surveyors give all the details of labour to stonework, and some surveyors stone, including beds and joints, and then the rest of the labour in detail, while others just put down a lump cube, including all labour of every kind? I have heard it said that the practice of surveyors in measuring the detail varies so much that it reduces the pricing to very much of a lottery. Now, this should not be, and in this, as in many other cases, it is surely time that the surveyors, in conference or committee, instituted general rules of practice.

I have selected the foregoing instances, not as the most important, but as familiar points, to illustrate my contention that even in the best class of quantities great improvements may be made if only a more uniform standard of procedure be observed.

It is obvious that these could be indefinitely multiplied, but not without outraging the proportions of this paper.

There are those bills of quantities, before referred to, which are beneath criticism, such as one that lately was brought under my notice, in which the quantities of an embankment to a river were thus elaborately dissected. "149′-0″ run forming embankment to river, as sketch." Here was inserted a rough sketch,—not to scale,—with figured dimensions and description of material, "to be executed as 'tide work,' and to include digging and barging away ground, and any planking and strutting necessary in its execution." That was all. A better illustration of the "lumping" style would, I think, be difficult to find.

I have left the most important factor in this question to the last, because it is the key to the whole matter.

The responsibility of the surveyor who prepares the bill of quantities to the contractor, who bases the amount of his contract upon these bills, has been considered to be the greatest guarantee for accuracy, and that the utmost care and skill the surveyor possesses will be used, and that any want of care and skill will be exercised at the surveyor's peril. Hence the ingenuity shown, especially by incompetent men, to evade this responsibility by "sweeping" descriptions "covering" items which may mean anything or nothing, or everything; a studious avoidance of clearness; a general "slipperiness," which is difficult of definition, but the character of which many of us know too well.

All this tends to show that this liability was considered a real and definite one,—not a moral responsibility, but a legal obligation.

Now, this has proved a pretty good working arrangement. Many a man who would have liked to finger the "so much per cent. upon the total amount of tender" has hesitated to "go in" for it, not from a sense of his unfitness for the work, but from the loss and punishment which the result of that unfitness might inflict upon his pocket.

Some of this class, more hungry than others, or greatly daring, have tried to shield themselves in the following brazen-faced way. The phraseology may differ, but the aim and intention are the same. A clause is inserted in the quantities that:—

"The successful contractor will be allowed one week from date of acceptance of his tender for the purpose of checking at his own expense the accuracy of the quantities. If, after such checking of the quantities, the contractor should not be satisfied with their accuracy, they should be revised by the contractor and the surveyor of the quantities jointly, and if, on examination of the whole of the items, the sum of any errors does not effect an increase in the amount of the tender, the expense of revising the quantities shall be borne by the contractor, and no further question as to the accuracy of the quantities will be entertained."

You will observe that nothing is here said as to payment to the contractor, or non-payment to the surveyor, if the quantities are found to be wrong. This, of course, is characteristic.

I have seen attempts to evade the consequences of error more glaring than this, in which no offer of an opportunity or time is made for the verification of the quantities, but where they were thrust down the throat of the contractor with the plain and bare intimation that no claim for any deficiencies would be entertained after signing the contract.

It may be said that such gentry are of no weight or influence, and that the consequences of their actions are unimportant upon the profession and trade. I hold, however, that sharp practice and improper conduct in any profession, if allowed to pass without protest from the governing body, is a slur and scandal upon that body.

But there is now a serious,—nay, an exceedingly grave,—feature to be noticed. The eminent surveyors of London, who have, so far as I know, never repudiated or questioned their responsibility to the builders, are no longer masters of the situation, for by a recent legal decision* it seems to have been settled that the supposed responsibility of the surveyor to the builder has no existence, and the very foundations of the mutual confidence which has hitherto ruled their business relations are destroyed. On the one side, the guarantee for the accuracy of the quantities will no longer ensure good work, for if no responsibility exists the great incentive for such work is gone, and the slip-shod man is so far on a level with the capable one. On the other hand, if there be no contract between the surveyor and builder, as this decision implies, there surely cannot be any obligation to pay on the part of the builder; so it cuts both ways. The moral obligation, no doubt, exists, and this, we hope, in any case will actuate the majority of both communities. But, unfortunately, there is a class who are apt to interpret their moral responsibilities by their legal liabilities, and for these binding laws have to be made.

The situation seems intolerable, and some means must at once be taken to clear the matter up. It seems monstrous that a man should not be responsible for his imperfect work. What would be said of a tailor who expected full payment for a coat with a big hole in the back? That is no more absurd than for a surveyor to expect payment for quantities with a big deficiency in the brickwork. And it would be equally immoral, whatever the legality, for a builder to refuse payment for a correct bill of quantities he had used. And yet this seems to be what the law allows.

It has been said since this decision that the action of the law is one-sided, that the builder is a bailee,—whatever that means,—and bound to hand over the surveyor's fees, whatever the character of his work may be. If this monstrosity be legal, I cannot imagine the body of surveyors long consenting to exist under such an iniquitous law. Otherwise it is certain that contractors would be compelled to protect themselves from the irregularities which (already too frequent) would soon become rampant, and thus the discontent which now exists as to the appointment of surveyors, and other matters, would become intensified. However much such a result might be deplored, hostile action, good for neither party, might be taken.

If no central body of surveyors exists with power to deal with this and kindred matters, it is time such a body be created, for this question must be dealt with promptly, and by the surveyors themselves, if they wish to remain masters in their own house.

All other professions worthy the name are year by year making the qualifications of their members higher and more responsible, their rule of conduct more stringent, and the punishment of any infraction of rule or conduct more severe. If reform does not proceed from inside the body, more drastic measures may be forced on from outside.

But I hope the community of interests will enable surveyors and builders to meet together and take counsel in the old friendly manner to devise a way out of the present trouble, and to establish some permanent settlement of the various difficulties which now exist,—an arrangement which will tend to make architect, surveyor, builder, and employer equally useful links in a chain of mutual helpfulness, every one doing his part to uphold the high position which the great and good old trade of building ever should occupy.

THE CULTS AND MONUMENTS OF ANCIENT ATHENS.

The Sanctuary of Asklepios, on the south side of the Akropolis, formed the subject of the fourth of Miss Harrison's lectures on Nov. 23. The god Asklepios, the Roman Æsculapius, has till lately been known to us in art only from rather uninteresting representations of the Græco-Roman period; and perhaps we have been accustomed to think of him as the rather dull though respectable prototype of the modern physician. The excavation of the Asklepieion at Athens, in 1875, and, above all, the recent excavation of the great shrine at Epidauros (referred to in the last lecture) have let in a flood of new light on the subject. Asklepios is now shown to be a genuine, old-fashioned divinity, and his worship, as the lecturer put it, no longer pointed to a second-rate medical science, but to a first-rate superstition. In order to arrive at a clear notion of the personality

* "Priestley & Gurney *v.* Stone": see *Builder*, last volume, pp. 50, 69, 70; and current volume, pp. 75, 88, 126, 162, *ante*.

of the god, Miss Harrison went into a somewhat minute investigation of the Epidauros genealogy of the god given to us in the great *Isyllos* inscription. Asklepios should be kept completely distinct from Apollo, whose son he was made only in later traditions. These had doubtless an Ionian and Delphic source. The priests of Apollo, jealous of the celebrity of Æsculapius, and fearing he should entrench in some of his attributes on the worship of Apollo, determined, since it was impossible to oust him, to insist on a joint worship of the deities, by making Apollo father to Asklepios (see Pindar, Pyth. III.). An examination of the art types of the god show him to be very unlike Apollo. He is more often represented as a middle-aged god of the Zeus type, with the lower part of the body fully draped, holding a staff entwined by a snake. The snake here was no emblem of immortality, but just as in the case of the *Kerukeion*, or herald-staff of Hermes, marks a connexion with the powers of the under-world.

From the remains of the precincts of Asklepios, as well as from literary tradition, we find the same general features, whether at Athens, Epidauros, or Sicyon. The whole enclosure was of the nature of a hospital. It contained invariably the shrine proper of the god, a well of good water,—a most important and distinctive feature of the cultus,—and a stoa for the patients to walk in. The celebrated passage in Aristophanes ("Plutus," ll. 627, *seq.*), although a comic exaggeration, shows the popular beliefs with regard to the ceremonies to be performed in order to be cured by Asklepios. First, there was a purification by water, next followed the *incubatio*, and sleeping in the temple, when Asklepios, often accompanied by his children, would reveal to the sufferer in a dream how he should be cured of his disease. Very entertaining are some of these prescribed "cures," as we gather them from inscriptions set up by grateful patients. The most notable of all these inscriptions does not come to us from Athens, but from Epidauros. It was set up by a certain M. Julius Apellas, who "suffered from many diseases, and especially from indigestion." The first advice the god gave him was sound enough; it was not to be so nervous about himself. Then Apellas proceeds:—"The god ordered me to eat bread and cheese . . . . to use the bath . . . . after the bath to rub myself against the wall . . . . to go bare-foot . . . . to pour wine into the hot water before I got into the bath—and to give the attendant an attic drachma"! And once the god ordered him to put honey into his milk, "that it might be easier of digestion." At the end, the priest of Asklepios says to him, in a businesslike way, "you are cured, and now you must pay your fee." Extremely interesting and quaint are some of the *ex-votos* from the Asklepieion of Athens. One inscription is set up by an Athenian cook, in gratitude for a miraculous cure. Another tablet shows, carved in relief, a box of surgical instruments, dedicated by the doctor who had successfully accomplished some operation. Another shows a pair of ears, offered by some patient cured of the ear-ache. A more dignified, but scarcely so entertaining, series of offerings consist of reliefs representing Asklepios himself, sometimes standing, sometimes seated, accompanied by his children, and at times also by the Eleusinian deities Demeter and Kore, with whom his cult was closely connected. In conclusion, Miss Harrison showed how, in earlier and more heroic times, Asklepios was rather a god of divination than a god of medicine. Plato, we know, thought it a disgrace that men who could by exercise keep their bodies healthy should be obliged, except in the case of a wound, to have recourse to a doctor. Later, this healthy tone disappears, morbid views of illness are taken, even convalescence has its god *Telesphoros* called in to help Asklepios. The shrines of Asklepios are thronged with votaries; and in Italy, in the age of the Antonnines, the worship of the god of medicine reached its highest pitch. Men believed that even diseases of the soul might be reached through the channel of the body, especially when the body was inactive, and its forces dulled by sleep.

THE FALL OF BUILDINGS AT THE WEST-END.

ON Tuesday the Coroner for Central Middlesex, Dr. G. Danford Thomas, resumed his inquiry into the causes of the deaths of the six men who were killed by the fall of the buildings in course of construction in Great Titchfield-street, Marylebone, on Friday, the 9th ult., as mentioned in the *Builder* for the 17th ult., p. 363. We take our report of the evidence from the *Times*.

John Richards, foreman of the works, was recalled, and said there were thirty-eight men employed in the building. The sand used in mixing the mortar was obtained from Fulham and Kensington, and the work was being carried out in accordance with the specification, under the direction of Mr. Miller, the architect, by whom it was drawn. The mortar was good and the bricks good stock bricks. Mr. Miller himself acted as clerk of the works, and the District Surveyor visited the building on several occasions. The ground floor was shored up because they wished to place bricks upon it, and as a fact some 35,000 bricks were placed on it; the work of the shoring was done by the navvies. It was usual to stack bricks on the flooring when they had a limited space. He could not tell the weight of 35,000 bricks.

The Coroner.—If that be the case, how could you form a judgment as to what shoring was required?

The witness said he would use his own judgment. At the time of the accident there were only some 3,000 or 4,000 bricks on the flooring. The shoring was removed in accordance with the weight of the bricks, and at the time of this occurrence all the shoring had not been removed. They did not use any of the soil that was taken out of the building for the purpose of making mortar. It was all carted away from the building.

Robert Williams, who described himself as travelling foreman to Messrs. Oldrey, said it was his duty to go from job to job to see and report upon the progress of the work. He visited the buildings in Great Titchfield-street, and considered the work was going on satisfactorily. During the progress of the building no complaints were made to him by any of the men. He considered the mortar and other materials very good.

Mr. Walter James Miller, architect and surveyor, said he had been in practice sixteen years, and prepared the plan and specification for the building which had fallen, and visited the building two or three times a week. There was no clerk of the works, as it was not of such magnitude as to require one. The contract was signed on Aug. 13, and the work was to have been completed in seventeen weeks. After the contract had been signed the old building was pulled down, and the clearance was made in about four weeks. Only a few bricks were used in the new building. He did not see the foundations made because he was away on his holidays, and that work was superintended by his assistant, Mr. Freeland. His chief duty was to see that all witness's plans were carried out. He returned to the work on October 8 and found that it had progressed up to the first floor, and he approved of what had been done. He visited the building occasionally from that time till this occurrence took place, some three or four hours a week. From what he saw he had no fear whatever about the safety of the building. He noticed the flooring was shored up owing to bricks being upon it. Thirty-five thousand bricks would weigh between 70 and 80 tons, and if the shoring bar was not complete it would cause extra weight to be put on the walls.

In cross-examination, Mr. Miller stated that the building had been erected in accordance with the plans and specification with one exception, which was with regard to the depth of the ground, and that was only slight deviation. He had not formed any decided opinion as to the cause of the accident, but he thought it might be possibly caused by loading the floor with the bricks, causing the wall to become ruptured or receive a shock before the wall had become properly set. He found that some parts of the wall had only been bonded by half bricks instead of whole ones, but he did not think this caused the accident.

At this stage of the proceedings the Court adjourned till Wednesday next.

The London Central Winter Fund of House Decorators and Painters.—We are asked to mention that this fund will take a "Ticket Benefit" at the Princess's Theatre from December 3 to 8, when the piece, "Hands Across the Sea," will be played. The society, we are informed, was established in 1874 for the purpose of paying a small sum weekly to its members when unemployed during the winter. Tickets only will benefit the fund. They may be had from the secretary, Mr. E. W. Blades, 28, Longford-street, Albany-street, N.W.

THE ART CONGRESS AT LIVERPOOL.

THE following is the programme of the Congress to be held at Liverpool next week, under the auspices of the "National Association for the Advancement of Art, and its Application to Industry":—

On Sunday, December 2, Art Congress Sermons will be preached by Archdeacon Farrar at the Church of the Blind, Hardman-street, 11 a.m. and 6.30 p.m.

Monday, December 3.

4.45 p.m., Meeting of Central Committee of the National Art Association, at the Walker Art Gallery.

8.0 p.m., *Presidential Address*, by Sir Frederick Leighton, Bart., P.R.A., at the Concert Room, St. George's Hall.

Tuesday, December 4.

10.30 a.m., *Architecture.*—Presidential Address, by Prof. Aitchison, A.R.A.

10.15 a.m., *Applied Art.*—Mr. W. E. Willink, A.R.I.B.A., on "The Home Arts Movement." Mr. G. H. Garroway, on "The Liverpool Art Workers' Guild." Mr. H. B. Bare, F.R.I.B.A., on "A School for the Artistic Handicrafts."

11.30 a.m., *Painting.*—Mr. James Towers, on "Encouragement of Local Art." Mr. James Paterson, "On the Cultivation of the Love of Art."

11.30 a.m., *Sculpture.*—Mr. G. Simonds, on "The Importance of Sculpture in Civilisation."

11.30 a.m.—*Museums.*—Mr. E. Rimbault Dibdin, on "A Contribution towards the Art History of Liverpool." Mr. Charles Dyall, "Do Picture Exhibitions Promote or Impede the Progress of Art?"

3.0 p.m., *Painting.*—Presidential Address, by Mr. L. Alma Tadema, R.A.

3.45 p.m., *Applied Art.*—Mr. G. H. Morton, Jun., on "The Agreement of Colour Theories with Practice." Rev. H. O. Rawnsley, on "Country Industrial Art Schools: their Aims, Claims, and Needs."

3.45 p.m., *Museums.*—Mr. W. M. Conway, on "Reproductions of Ancient Works of Art for Municipal Museums." Lieut.-General Pitt Rivers, F.R.S., on "The Classification of Objects in Museums."

4 p.m., *Sculpture.*—Mr. R. Pinker, on "Choice of Materials for Sculptural Decoration."

4 p.m., *Architecture.*—Mr. J. D. Crace, on "The Proper Aims and Limits of the Coloured Decoration of Architecture." Mr. E. J. Tarver, on "Proposed Improvements in Theatre Planning."

Wednesday, December 5.

10.30 a.m., *Applied Art.*—Presidential Address, by Mr. Walter Crane.

11.30 a.m., *Painting.*—Mr. F. Bate, on "The Tendencies of Modern Art." Mr. R. F. Hallward, on "The Emancipation of the Picture."

11.30 a.m., *Sculpture.*—Messrs. T. Stirling Lee, and Wm. Emerson, F.R.I.B.A., on "The Decoration of Public Places and Buildings."

11.30 a.m., *Architecture.*—Mr. T. G. Jackson, M.A., on "Obstacles Opposed to the Progress of Architecture by Architects themselves." Professor Roger Smith, F.R.I.B.A., on "Architecture as Part of a Liberal Education."

11.30 a.m., *Museums.*—Mr. J. Pyke Thompson, on "The Turner House at Cardiff." Mr. Whitworth Wallis, "A Short Account of the Birmingham Corporation Art Gallery."

11.30 a.m., *National and Municipal Encouragement of Art.*—Mr. Edwin Seward, A.R.I.B.A., on "The Development of Local Influences for the Advancement of Art."

3 p.m., *Museums.*—Presidential Address, by Mr. Sidney Colvin.

3.30 p.m., *Painting.*—Mr. W. E. F. Britten, "Our Claims as Artists." Mr. H. H. La Thangue, "Art Education."

3.30 p.m., *Sculpture.*—Mr. J. B. Gibbs, on "The Influence of Sculpture on Painting." Mr. Walter Armstrong, on "The Proper Decorative Use of Sculpture."

3.30 p.m., *Architecture.*—Mr. E. P. Warren, on "The Coloured Decorations of Churches." Local Papers.

3.45 p.m., *Applied Art.*—Mr. William Morris, on "Art, and its Producer."

4 p.m. to 6 p.m., Reception by the Royal Institution in the Art Gallery, Colquitt-street.

8 p.m., *Art Congress Soirée* in the Walker Art Gallery, Rotunda Reading Room, and the Brown Library.

8 p.m., *Concert*, Grosvenor Room, Walker Art Gallery.

9 p.m., in the Rotunda Reading Room, Mr. Henry Blackburn will show Lime-light Illustrations of English and French Modern Art.

9.30 p.m., Cinderella Dance, in the Brown Library.

Thursday, December 6.

11.30 a.m., *Combined Meeting of the Sections of Painting, Architecture, and Applied Art.*—Mr. G. F. Watts, R.A., and Mr. J. D. Sedding, F.R.I.B.A., will take part in the proceedings, and Mr. G. T. Robinson will speak on "Sgraffito and other Processes of Decoration in Plaster."

11.0 a.m., *Sculpture.*—Mr. E. Onslow Ford, on "The Modern Realistic School." Mr. Samuel Fry,

on "Architectural Carving." Professor W. C. Roberts-Austin, on "The Precious Metals."

11.30 a.m., *Museums.*—Mr. George Wallis, on "The Economical Formation of Art Museums for the People." Mr. Walter Armstrong, on "Logic in Art: A Plea for Decoration."

3 p.m., *Sculpture.*—Presidential Address, by Mr. Alfred Gilbert, A.R.A.

3.45 p.m., *Applied Art.*—Mr. Lewis F. Day, on "Fashion and Manufactures." Sir Philip Magnus, on "The Teaching of Industrial Art." Mr. T. Cobden Sanderson, on "Craft Ideals"

4 p.m., *Painting.*—Mr. John Brett, A.R.A., on "The Relation between the Pictorial and the Decorative Arts."

4 p.m., *Architecture.*—Mr. Basil Champneys, B.A., on "Style." Mr. H. H. Statham, F.R.I.B.A., on "Nature and Architectural Ornament."

4 p.m., *Combined Meeting of the Sections for Museums and National and Municipal Encouragement of Art.*—Mr. T. C. Horsfall, on "The Importance of Connecting Elementary Schools with Art Galleries." Mr. P. H. Rathbone, on "Lessons from France."

8 p.m., *Conversazione* at the Liverpool Art Club.

Friday, December 7.

10.30 a.m., *Combined Meeting of the Sections of Sculpture, Architecture, and Applied Art.*—Mr. G. Simonds, on "Sculpture, and its Relation to Architecture." Mr. J. Belcher, F.R.I.B.A., on "The Alliance of Sculpture and Architecture." Mr. J. D. Sedding, F.R.I.B.A., will also take part in this meeting.

11.30 a.m., *National and Municipal Encouragement of Art.*—Professor Baldwin Brown, on "Mural Painting." Mr. Patrick Geddes, "Economic Arguments for the Encouragement of the Fine Arts."

3.0 p.m., *Painting.*—Mr. W. B. Richmond, A.R.A., on "A Strict Method for Study of the Human Figure."

3.0 p.m., *Architecture.*—Mr. J. J. Stevenson, F.R.I.B.A., on "The Planning of Towns." Mr. J. J. H. Sumners, F.R.I.B.A., on "The Practical Outcome of the Art Congress."

4.0 p.m., *National and Municipal Encouragement of Art.*—Presidential Address, by the Right Hon. A. J. Mundella, M.P.

8.0 p.m., *Conversazione* at Streatlam Towers, Prince's-road, the residence of Mr. and Mrs. James L. Bowes (by invitation).

ARCHITECTURAL SOCIETIES.

Liverpool Architectural Society. — At the second ordinary meeting of the present session of the Liverpool Architectural Society, held in the Free Library, William Brown-street, on Monday evening, Sir James Picton gave an address upon the "Town Halls of Liverpool."

Leeds and Yorkshire Architectural Society.—The second meeting of this society for the present session was held on Monday evening in the rooms, Infirmary-street, Mr. Henry Perkin (President) in the chair, when a lecture was delivered by Mr. Arthur Marshall, A.R.I,B.A. (Nottingham), on "Old Carved Furniture and Woodwork." Art, as applied to household decoration, said Mr. Marshall, was beginning to receive more attention than it had done for many years. In his opinion an architect's duties were not confined to plans and designs for buildings, but extended to furnishing and decoration, arguing that it was equally within their scope to guide public taste in this direction. Going back to the carving of the thirteenth century, he said that the examples were somewhat rude, and had few pretentions to ornamental beauty. In the fourteenth and fifteenth centuries. however, woodwork became more ornamental, and in some of our village churches there still existed some magnificent examples of chests of the latter century. Mr. Marshall gave specimens of Derbyshire and Yorkshire chairs, and described their characteristics. Settles and "thrower" chairs received attention, and the lecturer spoke of the use of pack-chests and court cupboards. Coming to tables, Mr. Marshall said that up to the Tudor period they were both rude and cumbersome. The old tables had a carved rail along one side, as it was the custom of the guests to sit on one side only, the waiting being done from the other. He commended to his hearers the revival of the art which was once exercised in the carving of doors, fireplaces, and overmantels. Having described some of the ancient beds, Mr. Marshall said it had been argued that old furniture was unsuitable to modern requirements; but, if looked upon from the standpoint of those who attached greater importance to stability and ornamental effect and comfort, it must be viewed in a different light. He often wondered at the want of taste manifested by many people in the selection of their furniture. He warned his hearers against forgeries of old furniture, which he said were largely carried on, and spoke with commendation of the efforts which were now being made in some of our technical schools to revive the art of carving. A vote of thanks was accorded to Mr. Marshall for his lecture, on the motion of Mr. Herbert Hodgson, seconded by Mr. Butler Wilson.

AUTOMATIC SPRINKLERS.

Sir,—In your issue of September 22 you describe a form of automatic sprinkler for the prevention of the spreading of fires in buildings, and as just now attention is being drawn to this subject, I should be glad if you would permit me to state that twenty-four years ago, viz., in 1864, I went over this ground very carefully, and, as the result, invented and exhibited a sprinkler that is to-day admitted by the highest American authority on the matter to anticipate (in Americanese, "knock the bottom out of") every patent ever since taken out for this kind of article.

I enclose circular printed about September, 1865, with drawings, from which you will see that the whole question was threshed out, and nothing left to be done but to adopt the valve, and thus save millions of valuable property, since unhappily destroyed. But the ultimate result to me, however, was melancholy enough. After spending month after month, and about 800*l.* in cash, in experiments and advertisements; after sending models and descriptions to all Governments of the civilised world, and writing all the insurance authorities,—persevering for years, I have never during these twenty-four years *sold a single valve*, or had a single serious inquiry as to its merits or use.

It was not patented or protected in any way, and anybody could make or sell it, still I never sold one, not even as a pattern for some one else to make them from.

The fact was that the public mind was not awake to the importance of the question, and it needed American acuteness to see that loss by fire was positive loss, even when the loser himself was covered by insurance.

The truth grasped at last, the automatic sprinkler began in various forms to take over there, and there they sell by millions, and now even here there are hundreds of mill-owners and others paying premiums and royalties to Americans, who could at any time during a quarter of a century have had the same thing from an Englishman for the cost of making. A. Stewart Harrison.

*** Mr. Harrison's pamphlet and illustrations enclosed appear to bear out his claim. We are inclined to think he would have had a better chance of success if he had patented his invention. Many tradespeople, we believe, do not think much of an invention unless it is patented.

COMPETITION FOR HOTEL AT DOUGLAS.

Sir,—Permit me to inform the correspondent who writes in last week's issue of the *Builder* [p. 382] concerning the competition put forth last year by a Mr. Louis Kelly, of Douglas, Isle of Man, of my experience in regard to the same.

After receiving the very gorgeously-coloured block plan and the particulars, I sent my design in at the appointed time, and, after the interval of six weeks or so, I wrote, asking for the decision, thinking that it must have been decided; and then, some time after,—I think about a fortnight,—I received a letter, which I regret I have not kept, but which was to the effect that the gentleman to whom the drawings had been entrusted had not made known his decision yet, which would be communicated to me as soon as he did so. After the receipt of which a considerable period intervened, until I received my drawings, with the following letter, written, presumably, by Mr. Kelly's clerk, which I have fortunately kept:—

"Broadway, Douglas, Isle of Man, Feb. 11, 1888.

Re Comp. Plans.

Dear Sir,—The prize has been awarded to Mr. Pennington, of Southport, and Ramsey, Isle of Man. I return your drawings per this post, and remain, dear sir, yours truly, Jos. D. Rogers, for Louis Kelly."

Concerning which I think your correspondent will agree with me that further comment is unnecessary.

H. D. W.

COLFE GRAMMAR SCHOOL COMPETITION.

Sir,—Last week's issue of the *Builder* contains an advertisement of mine for tenders, "Colfe Grammar School, Lewisham," which gave most of your readers and doubtless the other competitors the idea I had been appointed architect to the above school. In fairness to the other three competitors (Messrs. Giles & Gough, London; Messrs. Clark & Moscrop, Darlington; and Mr. H. T. Bonner, London), permit me to say such is not the case.

The explanation is that the four selected competitors have been instructed by the Governors of the Leathersellers' Company to obtain tenders for their respective designs. The advertisement is corrected this week. E. Lyne Parsons.

Exeter, Nov. 28.

The Student's Column.

ARTIFICIAL STONES.—XXII.

Methods of Indurating Artificial Stone by Exposure to Gases.

THE special methods for hardening or accelerating the induration of artificial stones by exposure to carbonic acid and other gases may now be briefly enumerated.

M. Claudot patented in 1855 a marble-like stucco or artificial stone composed of slaked lime mixed with water highly charged with carbonic acid. This may be directly applied to walls, &c., as a kind of plaster, or artificial stone may be formed by mixing the lime with powdered shells, sand, and similar substances with as little water as possible, and pressing the mixture into moulds. When dry the stone is exposed in a closed chamber to an atmosphere of highly compressed carbonic acid gas.

Picker, in 1867, also employed carbonic acid gas for indurating lime containing artificial stones by exposing it for long periods to its influence. Hyatt, in a portion of his specification, published in 1873, mentions carbonic acid gas as an indurating material; and in 1874 Preussier patented arrangements for producing artificial stones from mixtures of sand and lime, which, after being moulded, are subjected in chambers to the action of carbonic acid gas drawn direct from the lime-kiln. H. J. Allison, according to his patent (1884, pat. 16,000), hardens or carbonates in some cases his artificial stone mixtures by exposure to the action of carbonic acid gas in closed chambers or dissolved in water.

In 1882 W. Walker made a new departure by utilising, for the purpose of improving artificial stone, what he calls "Sulphuretted Steam," obtained by passing steam through granulated or powdered sulphur; and the same year J. W. Butler proposed to utilise a mixed atmosphere of sulphur steam and carbonic acid gas for the same purpose.

The *raison d'être* of these patents is apparent: the carbonic acid gas is to unite with the line to form carbonates, and the sulphur compound ultimately, by oxidation, produces sulphate.

Mechanical Devices for Improving and Binding Artificial Stones.

The chief mechanical devices which have been adopted with a view to accelerate the induration of artificial stone, or to bind together the components of the stone, or structures formed therefrom, are the following:—R. Thompson, in 1853, prepared perforated building stones from blue lias lime, or strong grey lime fresh from the kiln, mixed with sharp sand, cement, and gravel, and moulded while still hot, the mould being perforated to admit of rods being run through the composition, and withdrawn after it has set; the surface, if proper sand has been used, can be made to closely resemble that of Portland stone, while, owing to the numerous perforations admitting air to a greater surface than would otherwise be possible, the bricks become extremely hard.

In L. D. Owen's patent (1856, pat. 1,270) the bricks or stones are formed of sand and lime, pressed into moulds strongly, and perforated thoroughly with the same object, as in the last patent, so that the blocks become unusually hard, and in a few months can hardly be distinguished from good sandstone.

The manufacture of cornices, blocks, window-heads, and other builders' requisites, patented by Eccles in 1859, involved the employment of clay earths, worked up with water, and moulded with as many holes throughout their mass as possible, dried in currents of air, and finally baked.

C. Pasquin, in 1864, patented the manufacture of keyed artificial stone, and Arntz, in 1873, also secured protection for artificial stones formed with tongue and groove, so that in building they can be locked together without cement. Several other patentees have worked at the same idea, but with no very important results.

Several patents relate to the mingling with the stone composition wires or fibres in order to increase its toughness. Highton, in 1868, introduced fibrous or metallic substances into the body of his stone, for the purpose of rendering it tougher and difficult to break.

Brannon (1874, pat. 1,246) arranged an imbedded sustaining frame or selvage, and a strained webbing to permeate the mass of concrete or cement; in the formation of these arrangements rope, cane, and cordage may all be employed, and stone so strengthened and sustained is termed by the inventor "Lignolithite."

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

15,476, Ventilating. E. Lofts.

According to this invention heated pipes or tubes are used, and the influx of air thus created is distributed without draught.

17,199, Drying Timber, &c. J. H. Shorrock.

By this invention a self-acting stove is used, and the timber is placed over a perforated, or latticed, bottom, beneath which the air being drawn from the stove through apertures in an air-pipe attached to a chimney, the draught of which draws the atmospheric air through the inlets to the stove continuously day and night. Suitable arrangements are provided for carrying away the liquids collecting below the perforated or lattice bottom in the process of drying.

2,886, Sash and other Pulleys. F. J. J. Gibbon.

A small wheel or pin is, according to this invention, cast upon the pulley, and falls into a longitudinal recess. The pin usually fixed in the pulley s thus dispensed with.

10,913, Drain-Traps. G. Davis.

According to this invention, the configuration of the ordinary drain trap is somewhat altered, and the trap is also fitted with a hinged grating. In the side walls suitable openings are made which form the trunnion bearings. A cap covers the grating, and also the pipe which contains the grating. The cap is pierced with a hole a trifle larger than the horizontal dimensions of the grating.

12,734, Wood Screws. C. D. Rogers.

This relates to an improvement in the mechanism for making wire-drawn wood screws, and is applicable to forming the heads of the screws, which is done by means of hammers having specially-shaped recesses formed upon their faces. As soon as the blank head is made, the slot across the face of the head is cut by a suitable tool. The metal forming the head of the screw is also compressed between dies to give greater strength.

12,830, Sash-Balance. J. McChesney and A. T. W. Cobham.

In order that the sash or shutter may be easily lifted, the sash pulley is by this invention fitted with a coiled spring in the interior, which, when the spring is wound by the fall of the sash, exerts its force and assists it in rising so soon as the sash is lifted.

NEW APPLICATIONS FOR PATENTS.

Nov. 16.—16,632, D. Jones, Closing the Proscenium Openings of Theatres, &c.—16,665, A. Boult, Air-tight Lids for Closets.—16,687, J. Burn, Sash Fasteners.

Nov. 17.—16,704, A. Mattison, Ceiling Hook.—16,729, F. Stokes, Finger-plates for Doors.—16,737, T. Leblon, Mosaic Tile.—16,744, W. Wise, Greenhouses and Garden Frames.—16,753, A. Gray, Grinding Portland, Roman, and other Cements.

Nov. 19.—16,786, R. Jackson, Securing Cords to Sash Windows.

Nov. 20.—16,846, C. Allen and others, Glazing.—16,860, W. Doehring, Plastering, Laths, &c.—16,884, A. Del Guerra and D. Steffans, Securing Doors.

Nov. 21.—16,920, J. Frost, Mitre-cramp.—16,940, W. Bendall, Paint-brushes.

Nov. 22.—16,975, T. Wolstenholme, Hanging Wall-papers, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

12,535, J. Balbirnie, Heating, Cooling, and Ventilating Buildings,—13,915, F. Broadbridge, Window Fastenings.—14,423, H. Metcalf, Ventilating Cowl.—14,733, A. Robb, Stonemasons' Points and Chisels.—14,900, T. Paxton, Attaching Door-knobs to Spindles.—14,957, T. Sanders, Sash and Basement Fasteners.—15,246, W. Thompson, Ventilators.—15,613, T. Panario, Water Waste Preventing Cisterns.—15,650, A. Clark, Fire Grates and Stoves.—15,680, H. Ames, Fire-places.—16,035, S. Challoner, Lacquers and Varnishes.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

15,771, F. Crane, Varnishes.—890, E. Brett, Ventilating Apparatus for Improving Draughts in Ventilating Shafts.—1,997, E. Dupont, Construction of Walls, Partitions, Roofs, &c.—5,682, C. Jones, Window Sash Fasteners.—6,908, E. Andreoni, Closing and Flushing Water-closets.—14,558, R. Sayer, Wall Tanks.—14,998, A. Rost, Chimney-flues.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

Nov. 19.

By G. A. WILKINSON.

Southend—Thames' Farm, and 73a. 3r. 26p., freehold	£18,000
Wapping—26, Old Gravel-lane, freehold	700
Sunbury, Staveley-road—Hamilton Cottages, freehold	140
Alexandra-road—Alexandra Cottages, freehold	340

By Messrs. LEAGE.

Islington—8, Essex-road, freehold	1,100

Nov. 20.

By BEARD & SON.

Bayswater—100, Westbourne Park-road, 47 years, ground-rent £5	450

By DEBENHAM, TEWSON, & Co.

Holborn—34, Southampton-row, 34 years, ground-rent £25	670
New Barnet—Ground-rent of £80, reversion in 91 years	1,530
Upper Teddington—Ground-rent of £185. 9s., reversion in 91 years	3,690

By CHESTERTON & SONS.

Kensington—3, Durham-villas, 59 years, ground-rent £25	2,990

By H. H. FULLER.

City—Improved ground-rent of £770, term 59 years	12,900
Old Bailey—Improved ground-rent of £143, term 59 years	2,450
Improved ground-rent of £100, term 59 years	1,750
Improved ground-rent of £105, term 59 years	1,925
Improved ground-rent of £220, term 59 years	3,775
Improved ground-rent of £211. 5s., term 59 years	3,225
New Cross—Profit rental of £22, term 57 years	350

By H. RUTLEY.

Haverstock-hill—Ground rent of £24, reversion in 97 years	575
Holloway—42, Mayton-street, 72 years, ground-rent £5. 5s.	240
Kentish Town—29, Marsden-street, 52 years, ground-rent £5	245
59, Grafton-road, 70 years, ground-rent £6	390
In rear of above, two plots of freehold land and leasehold stabling	260
Holloway—53 and 59, Orpingley-road, 89 years, ground-rent £10	270

Nov. 21.

By GIDDY & TURNER.

Wotton, Surrey—The freehold residence, Leylands, and 36 acres	4,550

By A. WALTON.

Stockwell—61, Aytoun-road, freehold	500
Hackney—40, Scawfell-street, freehold	410

By J. BAKER & SON.

Kilburn—29, 31, and 33, Birchington-road, 86 years, ground-rent £15	1,850

By E. J. TABOR.

Wokingham—The Wellington Brewery, with plant, and numerous public-houses	16,150
Maidenhead—"The Hand and Flowers" public-house, 76 years, ground-rent £15	1,450
"The Free House," in East-street, freehold, subject to a life aged 93 years	850
St. Luke's-road—The Norfolk Park Post-office, long leasehold	800

Nov. 22.

By H. J. BROMLEY.

Penge—An improved ground-rent of £32, term 38 years, and to the full rent for 26 years	720
Forest Hill, Perry Vale—Kemble House, 88 years, ground-rent £8. 15s.	250

By HOWELL, SON, & BONNIN.

South Kensington—23, Collingham-road and stabling, 84 years, ground-rent £44. 10s.	4,500

By C. D. LEVY.

Bryanston-square—13, Seymour-place, 40 years, ground-rent £21	575

By C. C. & T. MOORE.

Mile End—65 and 67, Grafton-street, 41 years, ground-rent £6. 6s.	560
45, St. Peter-street, 42 years, ground-rent £3. 8s.	285

By PROCKTER & FRASER.

Old Ford—"The Earl of Ellesmere" tavern, freehold	2,530
73 and 75, Ellesmere-road, freehold	700
21, 23, and 25, Chisenhale-road, freehold	1,150

MEETINGS.

FRIDAY, NOVEMBER 30.

Architectural Association.—Mr. J. L. Robinson, on "The Development of Irish Architecture from the early Keltic work to the Eighteenth Century." 7.30 p.m.

SATURDAY, DECEMBER 1.

Association of Public Sanitary Inspectors.—Mr. D. Richards on "A Few Characteristics of the Three Principal Animals used for Human Food." 6 p.m.

MONDAY, DECEMBER 3.

Royal Institute of British Architects.—Mr. Francis Hooper on "The Control of Building Operations in Paris, and its effect on the Architecture of the City." 8 p.m.

Art Congress at Liverpool.—For programme, see p. 399 of this week's *Builder*.

Society of Engineers.—Mr. W. Worby Beaumont on "High-pressure Steam and Steam-engine Efficiency." 7.30 p.m.

London Institution.—Professor Sylvanus Thompson, D.Sc., B.A., on "The Colours of Polarised Light." 5 p.m.

Society of Arts (Cantor Lectures).—Captain W. de W. Abney, F.R.S., on "Light and Colour." 8 p.m.

Royal Institution.—General monthly meeting. 5 p.m.

Clerks of Works' Association.—Paper by Mr. G. Dalton, on "Carpentry." 8 p.m.

TUESDAY, DECEMBER 4.

Art Congress at Liverpool (continued).

Institution of Civil Engineers.—Mr. J. Oliver Arnold, F.C.S., on "The Influence of Chemical Composition on the Strength of Bessemer Steel Tires." 8 p.m.

Birmingham Architectural Association.—Mr. C. E. Ponting, F.S.A., on "Edington Church, Wilts."

Manchester Architectural Association.—7.30 p.m.

Glasgow Architectural Association.—Mr. W. Fraser on "Jedburgh Abbey."

Society of Biblical Archæology.—Papers by Mr. P. le P. Renouf and Dr. Wiedemann. 8 p.m.

WEDNESDAY, DECEMBER 5.

British Archæological Association.—1. Mr. J. T. Irvine on "Discoveries at Peterborough Cathedral." 2. *Résumé* of the Glasgow Congress, by Mr. Thos. Morgan, F.S.A. 8 p.m.

Art Congress at Liverpool (continued).

Civil and Mechanical Engineers' Society.—7 p.m.

Society of Arts.—Mr. Henry Edmunds on "The Graphophone." 8 p.m.

Inventors' Institute.—8 p.m.

Builders' Foremen and Clerks of Works Institution.—8.30 p.m.

THURSDAY, DECEMBER 6.

Art Congress at Liverpool (continued).

Royal Archæological Institute.—(1) Mr. J. P. Harrison on "The Shrine of St. Frideswide"; (2) Three Papers by Mr. F. C. J. Spurrell. 4 p.m.

Sanitary Institute.—Sir Douglas Galton, F.R.S., on "The Future of the Amalgamated Societies, the Parkes Museum and Sanitary Institute of Great Britain." 5 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, DECEMBER 7.

Art Congress at Liverpool (continued).

Miscellanea.

British Archæological Association.—The first meeting of this Association for the session was held on Wednesday, the 21st ult., the chair being occupied by the Rev. S. M. Mayhew. Mr. C. Lynam exhibited a singular flat plate of copper, on which were engraved two seal-like medallions, one representing David with the harp. It is of thirteenth-century date, and was found in Staffordshire. Mr. Harris described some remarkable interments which have been found in the chalk near Havant. They consist of pit-like cavities, 20 ft. deep and 4 ft. square. At the base are traces of burnt matter and bones. Mr. Loftus Brock, F.S.A., exhibited old engravings of the great seals of William and Mary, and of William III. Mr. Earle Way described a large number of fragments of Roman pottery, recently found near St. George's Church, Southwark. Mr. J. W. Grover, F.S.A. exhibited a magnificent thirteenth-century cross, of brass, with Limoges enamel and jewels. It is the property of Mr. Conrad Cooke, and is in perfect preservation. The Rev. S. M. Mayhew exhibited a fine series of antiquities, among which may be noted a vase found near Bethany, an impression of the great seal of Charles I., an old miniature of Charles I., and many personal relics of William III. A paper was then read by Dr. Joseph Stevens, of Reading, on an early British cemetery, which has recently been discovered and excavated at Dummer, Hants. The site is at Middle Town Field, 655 feet above the sea level, and close to an ancient trackway leading from Winchester to Lilchester. The bodies have been burned, and the bodies arranged in rough, hand-made urns, inverted over the remains. Fourteen or fifteen urns have been found at a distance of only a foot below the present level. There were no signs of any tumulus. The second paper was by Mr. H. Syer Cuming, F.S.A.Scot., on personal relics of King William III. The paper described a vast number of rings, books, and other articles formerly belonging to the king, now in various collections.

India-rubber Pavement.—Herr Busse, of Linde, is introducing in several towns of Germany the use of india-rubber for paving streets. He laid down such a pavement for the first time last year on the Goethe Bridge, in Hanover, which has a surface of 1,000 square mètres, or 10,764 square feet. The new pavement, it is stated, proved so satisfactory that 1,500 square mètres (16,146 square feet) of ordinary carriage-road in the city were laid in india-rubber this summer. The Berlin corporation, having apparently satisfied itself of the value of the new pavement, has had a large area on the Lützow-Ufer paved with india-rubber, as an experiment, and the magistracy of Hamburg is likewise trying the pavement. It is asserted that the new pavement combines the elasticity of india-rubber with the resistance of granite. It is also said to be perfectly noiseless, not affected either by heat or cold, and not so slippery as asphalte. As it is further stated that it is more durable than the latter, it ought to prove a formidable competitor; but nothing has been made public as yet as to its comparative cost.

The "A. A. Lyric Club."—We are asked to say that the first concert under the auspices of this Club will take place at Anderton's Hotel on December 6 (not December 8, as previously announced in error), at 8 p.m.

The Plumbers' Company.—On Monday evening the Master (Mr. W. H. Bishop) and Court of the Plumbers' Company entertained a large company at Saddlers' Hall. The Master, in the course of the proceedings, referred to the work of the Company in the cause of sanitary reform, and said that in the metropolitan area in the period between 1854 and 1864 the increase of houses was 88,112; from 1864 to 1874 it was 141,472; and from 1874 to 1884 it was 190,841. In the period from 1854 to 1864 there were 28 new houses built every day; from 1864 to 1874, 45 houses; and from 1874 to 1884, 60 houses. At such a rate of increase as that, how great was the need of sanitary and other arrangements connected with the water-supply and the health of this vast city! It was impossible to read the report of the Congress of London and Provincial Plumbers of 1884 without being convinced that in the belief of the plumber his work was not being carried out efficiently, and now they had a union of three interests,—the general public, the master plumbers, and the operative plumbers,—all working in complete accord. In 1886 the Company opened a list for the registration of plumbers. In the session 1886-7 they had 580 applicants; 1887-8, 730; and in the current session 2,740, of which about 1,000 were received since July. Many facts pointed to the need of such a system of registration. For instance, in some of the examinations as many as 75 per cent. of the applicants had failed to pass. —— At the examinations of plumbers for registration on Saturday last, at the Guilds Institute, applicants were present from various parts of London, as well as from towns in Kent and Essex. The examinations embraced tests of joint-making, lead-laying, &c., and a series of questions relating to the qualities of materials, the construction of various forms of house fittings, and the principles of sanitation. The examiners were Messrs. C. Hudson, C. T. Millis, J. C. Ashdown, G. Davis, and L. F. Gilbert, the last representing the United Operative Plumbers' Association. One third only of the applicants succeeded in passing the examinations.

Property for Sale. — On Wednesday, December 5, at the Mart, by order of the late Mr. R. M. Lumley's trustees, Oatlands Dairy Farm, in Walton-on-Thames and Weybridge parishes. This comprises nearly 130 acres of meadow, arable, and wood land, with farmhouse and other tenements, whereof the lease will expire at Michaelmas, 1895. The property, watered by the Broadwater Lake, once formed part of the Oatlands Park Estate, seat of the Duke of York, and of his widow, the charitable and eccentric Duchess. Oatlands was acquired by Henry VIII. from the family of Rede in exchange for Tangridge Manor, in the same county. It was settled by Charles I. upon his consort, who here gave birth (1640) to their youngest son, Henry of Oatlands, in a house by the later kitchen garden, which was pulled down in Cromwell's time. The Queen returned to Oatlands after the Restoration, and at her death Charles II. leased it to Lord St. Alban's. William III. bestowed the fee simple upon Arthur, Earl of Torrington, who demised the greater part of his estates to Henry (Clinton), seventh Earl of Lincoln. Henry, ninth Earl of Lincoln, inherited in 1768 the Dukedom of Newcastle-under-Lyme at the death of his wife's uncle, Thomas Holles. His son and heir, Thomas, third Duke of Newcastle, sold Oatlands to the Duke of York, who, under an Act of 1804, bought the entire rights possessed by the Crown, and made considerable additions, including Brooklands, to the estate. In 1793 was destroyed by fire the mansion which Henry, seventh Earl of Lincoln, had erected. It was rebuilt on a very extensive scale by Holland, and of late years served, like Bentley Priory, for a hotel. The park gateway, towards Walton, had for inscription: "Henricus, Comes de Lincoln, hunc arcum, opus Ignatii (*sic*) Jones, vetustate corruptum, restituit.'

The Church of St. Mary-le-Strand.—As will be seen by an advertisement which appears on our front page, a meeting is to be held at King's College on Wednesday next, to consider the present deplorable condition of this church.

Alderman Saunders.—At the meeting of the Court of Aldermen, on Tuesday last, the Town Clerk read a letter from Mr. Alderman Saunders tendering his resignation, which was unanimously accepted.

Robert Boyle & Son, Limited.—The third annual general meeting of this company was held at the Cannon-street Hotel on the 21st ult., Mr. Gilbert Wood presiding. The Secretary (Mr. J. A. Dargue) having read the notice convening the meeting, the Chairman moved the adoption of the report, which recommended a dividend of 12 per cent. Mr. H. P. Stebbing seconded the resolution. There being no questions, the report and accounts were unanimously adopted. The directors and auditors having been re-elected, Mr. Stebbing proposed a vote of thanks to the chairman and directors for their excellent management of the business during the year. Mr. Eckstein seconded the resolution, pointing out as a satisfactory feature of the management of the company the small amount down for bad debts in the accounts submitted. The resolution was unanimously carried. Mr. Robert Boyle, in acknowledging the vote on behalf of the board, said:—I am glad to say that the demand for the various ventilating appliances manufactured by the company continues to increase both at home and abroad, which may be said to be owing, to a considerable extent, to not only our constant efforts to meet the requirements of our clients, but to the well-proved superiority of the latest improved form of the "Air Pump Ventilator," patented in 1882, which is much more efficient and reliable than any of the previous forms, and is now sold at about 50 per cent. less than the inferior forms formerly manufactured; at the same time, the ventilators are now made of a more ornamental character, and of the best rolled steel plates, galvanised, and painted with enamel paint, whilst the workmanship is of the highest class. Though this, of course, has very considerably reduced our profit on each article, the remarkable increase in the sales, which has resulted from thus reducing our prices to a minimum whilst providing nothing but what is of the best quality, has enabled us to not only again pay a dividend of 12 per cent., but to place one-sixth of the profits to the reserve fund, besides carrying a substantial balance, £1,248. 11s. 1d., forward to next year. The orders and sales for the past year show, I am pleased to say, a very satisfactory increase on the previous year, though that year was an exceptionally good one, whilst the profits are increased in proportion.

The English Iron Trade.—The English iron market displays a better tone, the weakness which showed itself during the last two or three weeks having disappeared. This must be looked upon as a favourable sign, considering that we are now in what is generally the dullest period of the year. He would be rash, however, who would expect any decided improvement before the opening of the new year. Pig-iron, although not largely dealt in, has firmed during the week. The Scotch warrant market has slightly revived, its tendency having been upwards. There has been more animation in the pig-iron trade of the North of England, and the Lancashire market keeps steady, although business is slow. An even current of trade rules in Staffordshire. There is a better tendency in the hematite iron trade of the north-west. The finished iron market has somewhat quieted down, but there is no giving way in prices on the part of manufacturers; if anything, they are inclined the other way. The tinplate market is steady and better in tone, the inquiry being good. The steel trade is brisk in nearly all its branches, with a large amount of work in the hands of makers. Shipbuilders do not report any falling off, while engineers enjoy a good run of work.—*Iron.*

Brandon Creek Bridge.—Mr. Dodman, of King's Lynn, having relinquished his contract for constructing the new steel and iron bridge over the river near Littleport, Isle of Ely, the construction of the work has been placed in the hands of Mr. Archibald D. Dawnay, Assoc.-Mem. Inst. C.E., who will shortly make a commencement. Messrs. Thackray & Son, of Huntingdon, are the contractors for the restoration of the abutments. The new bridge will consist of outside steel parallel girders, 6 ft. deep, steel fish-belly cross girders, and a deck of Mallet's buckled plates, riveted down. The roadway will be finished with wood paving instead of the usual "metal." The old bridge was formed with cast-iron segmental arches, of very good design, and had been built exactly fifty years, but was found quite inadequate to the present traffic, which includes heavy traction-engines. The reconstruction is being carried out from plans by Mr. R. Reynolds Rowe, M.Inst.C.E., Surveyor to the Isle of Ely, and Mr. T. H. B. Heslop, C.E., Surveyor to the County of Norfolk.

Large Sale of Ground Rents in the City.—The sale of the leasehold ground rents, last week, in Fleet-lane and the Old Bailey, secured on the premises of Messrs. Cassell & Co., brought together a numerous company at the Auction Mart. The sale had been necessary under the will of the late Mr. Petter, one of the partners, who was the owner, apart from the firm itself, of the ground rents. Mr. Herbert Fuller conducted the sale. The rents submitted amounted to 1,549*l.* per annum, the estimated value of the rack rents being about 6,000*l.* a year. They were offered in nine lots, all of which were sold. The most valuable of the lots was a ground rent of 770*l.* per annum on an unexpired lease of fifty years. For this lot there was a close and animated demand. It was put up at 8,000*l.*, and was ultimately purchased by Mr. Wood, on behalf of Messrs. Cassell & Co., Limited, for 12,500*l.* The next highest price was 3,225*l.* for a ground-rent of 211*l.* per annum, also on an unexpired lease of fifty years. The total proceeds of the sale amounted to 26,375*l.* It should be stated that the late Mr. Petter had become the freeholder of the land, which he from time to time leased to the firm and subsequent company for building upon.

The Knighton Girls' Home.—This new building, situate at Woodford Wells, Essex, erected for the Society for the Rescue of Young Women and Children, was opened on the 22nd ult. by a dedication service. The new building has been erected on the site of the old home, burnt down in January last, and is four stories high, faced with brick with stone dressings. It is designed to accommodate forty-five girls, with the necessary class, work, bath, dining, and other rooms, sick-ward, and offices, together with private rooms for the matron and staff. It has cost about 1,800*l.*, exclusive of furnishing. The plans were prepared by Mr. Edward Tidman, C.E., of Westminster, who had a silver salver presented to him by the committee in acknowledgment of his honorary services in designing and superintending the erection of the new home. Mr. F. J. Coxhead, of Leytonstone, is the builder.

Builders' Clerks' Benevolent Institution.—A special general meeting of the donors and subscribers to this Institution was held at the offices, 21, New Bridge-street, E.C., on Tuesday, Nov. 27, for the purpose of electing a pensioner on the Relief Fund. The applicant was Mrs. Elizabeth Shaw, whose case had been fully inquired into, and who had been pronounced eligible by the committee. Being the only candidate, Mrs. Shaw was elected by show of hands, making up the number of pensioners now on the books to eighteen. The chair was occupied by Mr. C. K. Turpin (Messrs. Kirk & Randall), in the absence of Mr. J. W. Hobbs, the President, whose duties as Mayor of Croydon prevented his attendance on the occasion.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ton	6	10	0	7	10	0
Teak, E.I. load	9	0	0	14	0	0
Sequoia, U.S. foot cube	0	2	3	0	3	0
Ash, Canada load	3	10	0	5	0	0
Birch ,,	3	10	0	6	0	0
Elm ,,	4	0	0	5	0	0
Fir, Dantsic, &c.	2	0	0	4	0	0
Oak ,,	2	0	0	4	10	0
Canada	5	10	0	7	0	0
Pine, Canada red	3	5	0	4	0	0
,, yellow	3	10	0	5	10	0
Lath, Dantsic fathom	4	10	0	5	10	0
St. Petersburg	5	0	0	6	10	0
Wainscot, Riga, &c. log	2	15	0	4	5	0
,, Odessa, crown	2	15	0	3	5	0
Deals, Finland, 2nd and 1st...std. 100	10	0	0	10	10	0
,, ,, 4th and 3rd	7	0	0	9	10	0
Riga	7	0	0	8	0	0
St. Petersburg, 1st yellow	10	10	0	15	10	0
,, 2nd ,,	9	0	0	10	0	0
,, white	8	0	0	10	10	0
Swedish	8	0	0	16	10	0
White Sea	9	0	0	17	10	0
Canada, Pine, 1st	16	0	0	25	10	0
,, ,, 2nd	11	0	0	17	10	0
,, ,, 3rd, &c.	7	10	0	10	10	0
,, Spruce, 1st	9	0	0	10	0	0
,, ,, 3rd and 2nd	7	0	0	8	10	0
New Brunswick, &c.	8	15	0	8	15	0
Battens, all kinds	5	10	0	12	0	0
Flooring Boards, sq., 1 in., prepared, First	0	11	0	0	14	6
Second	0	8	0	0	10	9
Other qualities	0	5	6	0	7	9
Cedar, Cuba foot	0	0	3½	0	0	3¾
Honduras, &c.	0	0	3½	0	0	3¾
Australian	0	0	2¾	0	0	3
Mahogany, Cuba	0	0	4½	0	0	5¼
St. Domingo, cargo average	0	0	4½	0	0	5¼
Mexican ,,	0	0	4¾	0	0	4¾
Tobasco ,,	0	0	4½	0	0	5¼
Honduras ,,	0	0	4½	0	0	5¼
Box, Turkey ton	5	0	0	12	0	0
Walnut, Italian foot	0	0	4½	0	0	6¼

METALS.	£.	s.	d.	£.	s.	d.
IRON—Bar, Welsh, in London...ton	4	17	6	5	0	0
,, ,, at works in Wales ...	4	7	6	4	10	0
,, Staffordshire, in London ...	5	15	0	7	0	0
COPPER—						
British, cake and ingot..... ton	80	10	0	82	0	0
Best selected	81	10	0	83	0	0
Sheets, strong	86	0	0	88	0	0
Chili, bars	78	0	0	0	0	0
YELLOW METAL.....lb.	0	0	7½	0	0	7½
LEAD—						
Pig, Spanish .....ton	13	3	9	0	0	0
English, common brands	13	10	0	0	0	0
Sheet, English.....	14	10	0	0	0	0
SPELTER—						
Silesian, special .....ton	18	0	0	18	5	0
Ordinary brands.....	17	15	0	18	0	0
TIN—						
Banca .....ton	103	0	0	0	0	0
Billiton.....	102	0	0	0	0	0
Straits	101	0	0	0	0	0

METALS (*continued*).	£.	s.	d.	£.	s.	d.
Australian	101	0	0	0	0	0
English Ingots.....	104	0	0	0	0	0
ZINC—English sheet .....ton	22	10	0	23	10	0
OILS.						
Linseed .....ton	18	17	6	19	0	0
Cocoanut, Cochin	27	10	0	28	10	0
Ceylon	26	5	0	0	0	0
Palm, Lagos	28	10	0	0	0	0
Rapeseed, English pale	31	10	0	0	0	0
,, brown	30	0	0	0	0	0
Cottonseed, refined	23	5	0	0	0	0
Tallow and Oleine	19	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
,, refined	7	0	0	12	0	0
TURPENTINE—						
American, in casks.....cwt.	1	14	6	0	0	0
TAR—Stockholm .....barrel	1	1	6	1	1	9
Archangel	0	12	0	0	12	6

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Pulling down and Removing Old Buildings ...	Poplar Board of Works	*Official*.....	Dec. 4th	xiii.
Waterworks.....	Sutton in Ashfield L.B.	G. Hodson	do.	ii.
Repairing of Roads	Mile End Vestry	J. M. Knight.....	Dec. 5th	xiii.
Water Mains, Hydrants, Sluices, &c.....	Mansfield U.R.S A. ...	G. Hodson	do.	ii.
Arcade, with Shops, Cellars, &c.	Pontypridd Arcade and Building Co., Lim. ...	Taylor & Evans.....	do.	xiii.
Stabling and Flooring, Bradford, &c.	Midland Railway Co. ...	*Official*.....	Dec. 7th	xi.
Annual Stores.....	G. N. R. Co.....	do.	Dec. 8th	ii.
New Schools and Teachers' House on old site	Harrow-on-the-Hill, &c. School Board	do.	Dec. 11th	xi.
Kerbing, Tarpaving, &c.	Lewisham Bd. of Works	do.	do.	xiii.
Pumping Engine and Boiler	West Ham Corporation	Lewis Angell.....	do.	ii.
Covered Way and Married Couples' Quarters	St. George's Union.....	H Saxon Snell.....	Dec. 12th	xi.
Brick Sewer, Lee Bridge, Kent.....	Met. Board of Works	*Official*	Dec. 14th	ii.
Works and Materials	St. George Hanover-square, Vestry	G. Livingstone	Dec. 15th	xi.
Mortuary, Stabling, Cottage, &c.....	Harrow Local Board.....	C. F. Hayward.....	Dec. 18th	xi.
Pontoon and Approach Bridge, Waiting rooms	Gt. Western Railway Co.	*Official*	do.	ii.
Passenger Station and Goods' Shed.....	do.	do.	do.	ii.
Pumps, &c.	Fareham Local Board ...	do.	Dec. 21st	xiii.
New Colfe School, for Leathersellers' Co.	Mr. E. Lyne Parsons...	E. Lyne Parsons	Dec. 28th	xiii.
Two Blocks of Infirmary Buildings, &c.	Brighton Guardians ...	B. H. Nunn	Dec. 31st	xi.
New Bridge and Removal of Existing Bridge	Glasgow, Hillhead, &c., Joint Bridge Com.	Miller & Bell	do.	xiii.
Construction of Railway, &c. British Honduras	Crown Agents for the Colonies.....	*Official*.....	April 3rd	xiii.
Wesleyan Chapel, Charlton	.....	H. H. Church	Not stated.	xiii.
New Colfe School, for Leathersellers' Co.	Clark & Moscrop	Clark & Moscrop	do.	xiii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Building Inspector	Willesden Local Board	150*l.*.....	Dec. 11th	xvi.
Assistant Surveyors, R. E. Dept.	Civil Service Com.	Not stated	Jan. 4th	xvi.

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

CAMBERWELL.—For building a detached house and stable at Forest Hill road, S.E., for Dr. A. Wheeler. Mr. C. W. Lovett, architect:—

J. Bate (accepted)	£1,150 0 0

CHISWICK.—For the supply of 1,000 yards of broken Guernsey granite, for the Chiswick Local Board:—

	s. d.
Mowlem & Co.....	13 10 per yard.
Falla	13 9 ,,
Turner & Son	13 8 ,,
Fennings	13 3 ,,
Nowell & Robson	13 3 ,,
Manuelle	12 11 ,,
Griffiths (accepted)	12 1 ,,

CLACTON-ON-SEA.—For the erection of six villa-residences in Carnarvon-road and Marine-parade, for Mr. A. R. Chamberlayne. Mr. E. C. Homer, architect, 99, Gresham-street, E.C.:—

Messrs. Ellis & Turner (accepted) ...	£3,150 0 0

CLACTON-ON-SEA.—For erecting six pairs of semi-detached villa residences, at Clacton-on-Sea. Mr. C. W. Lovett, architect, 14, Cockspur-street, London, W.:—

J. C. Allen	£6,000 0 0

CLAPHAM.—For warming the Clapham Public Library. Mr. E. B. I'Anson, architect:—

Thames Bank Iron Works Company...	£300 0 0
Robert Crane	218 0 0
Critall	150 0 8

CLAPTON.—For erecting stables and buildings for tramway, Lea Bridge-road, E., for Mr. J. J. Griffiths. Mr. C. W. Lovett, architect, 14, Cockspur-street, W.:—

Boyce	£4,430 0 0
Catley	3,900 0 0
Jackson	3,855 0 0
Chessum	3,650 0 0
Parker (accepted).....	3,610 0 0

CLEWER.—For erecting villa residence at Clewer, near Windsor, for Mr. D. Wilson. Mr. F. W. Rhodes, architect, 3, Clifford's-inn, W.C.:—

Winser & Co., Buckingham Palace-road, S.W. (accepted)	£900 0 0

CROYDON.—For the erection of a detached villa residence, Spenser-road, Blunt Farm. Mr. D. R. Dale, architect:—

Mutton (accepted)	£1,000 0 0

[No competition].

CROYDON.—For additions to the Liberal Club-house, Park-street, Croydon. Mr. Daniel R. Dale, architect:—

Messrs. North & Co. (accepted)	£180 0 0

[No competition].

CROYDON.—For the erection of one detached villa residence, Camden-road, Blunt Farm. Mr. Daniel R. Dale, architect:—

Dewdney (accepted)	£1,100 0 0

[No competition].

FRIERN BARNET.—For making-up five roads, for the Friern Barnet Local Board. Mr. Geo. Clarke, surveyor:—

W. H. Budden	£4,299 0 0
B. Cooke & Co.....	4,053 0 0
C. Killingback	3,753 0 0
Wm. Neave & Son	3,469 0 0
J. Jackson	3,432 0 0
Thomas Hall	3,424 0 0
Geo. Bell...	3,356 0 0
Mowlem & Co.	3,266 0 0
Rd. Mayo	3,250 0 0
J. Bloomfield.....	3,213 0 0
Nowell & Robson	3,119 0 0
Thomas Adams (accepted)	2,935 0 0
Tar Paving only.	
Marchu & Co.	755 0 0
J. Smart	491 0 0
J. Farthing (accepted)	486 0 0

[Five other contractors tendered for a portion of the works only.]

HAMPTON WICK.—For the erection of cow-house and dairy for Mr. Borett, Park-road, Hampton Wick. Plans and quantities by Mr. Elsam, architect and surveyor, Hampton Wick:—

Lansdown, Richmond	£349 0 0
Lane, Kingston	314 0 0
Oldridge, Norbiton	295 0 0
Constable & Son, Hampton Wick	280 0 0

LONDON.—For building seven dwellings at Blythe-street, Bethnal-green, for F. Garner. Mr. Needham, architect. Quantities supplied:—

J. Anley.....	£4,268 0 0!
Beale	4,157 0 0
J. A. Taylor	4,133 0 0
Walker	3,178 0 0
Winkley (accepted).....	2,780 0 0
Sharpe.....	2,460 0 0!

LONDON.—For erection of shop in Queen's Elm-parade, Fulham-road, Brompton. Mr. Daniel R. Dale, architect:—

Hoare (accepted)	£250 0 0

[No competition].

KIRKBY-IN-ASHFIELD (Notts).—For works of water-supply, for the Parish of Kirkby-in-Ashfield, Nottinghamshire, for the Basford Rural Sanitary Authority. Mr. George Hodson, engineer, Loughborough:—

Contract No. 1 (*General*).

D. Barry, Radcliffe-on-Trent	£3,859 0
Evans & Woodcock, Nottingham	3,675 0 0
A. Raynor, Nottingham.....	2,955 4 11
T. Smart, Nottingham.....	2,943 0 0
J. F. Price, Nottingham.....	2,922 0 0
H. Vickers, Nottingham.....	2,545 0 0
L. Foster, Radcliffe-on-Trent	2,500 0 0
J. Dickson, St. Alban's	2,462 0 0
Holme & King, Liverpool	2,450 0 0
J. Tomlinson, Derby	2,399 0 0
Josiah Dale, Northwich.....	2,343 4 10
Chas. Green, Rotherham	2,209 10 0

Contract No. 2 (*Pipes*).

J. & S. Roberts, West Bromwich.....	2,389 13 5
Cochrane & Co.	2,362 11 8
Sylvester & Co., Newcastle, Staffs....	2,252 17 10
H. Hopkinson, Nottingham	2,135 1 2
Staveley Iron Co., Chesterfield	2,112 1 7
Oakes & Co., Alfreton	2,035 4 8
Stanton Iron Co., Alfreton	2,002 12 6
Butterley Iron Co., Alfreton	1,987 18 0

LONDON.—For alterations to Nos. 98 to 106, Cannon-street, for the India Rubber, Gutta Percha, and Telegraph Works Company, Limited. Mr. Henry Dawson, architect, 46, Finsbury-pavement, E.C.:—

Patman & Fotheringham	£6,683 0 0
J. Woodward	5,900 0 0
C. Kynoch & Co.	5,794 0 0
Colls & Son	5,285 0 0

LONDON.—For the erection of the Chelsea Public Library, Harrow-road, Kensal-town, W., for the Chelsea Public Library Commissioners:—

Bax	£4,315 0 0!
Munday	3,400 0 0
Perry & Co.	3,348 0 0
Shillitoe & Sons	3,312 0 0
Staines & Son	3,225 0 0
Peto Bros.	3,219 0 0
Nightingale	3,190 0 0
Ward, Clarke, & Co.	3,168 0 0
Chinchen.....	3,150 0 0
Picken	3,127 10 0
Battley	3,064 0 0
Dabbs	3,050 0 0
Brass & Sons	3,040 0 0
Lidstone	3,030 0 0
Stimpson & Co.....	3,030 0 0
Simmons.....	2,989 0 0
Wall.....	2,983 0 0
Prestige & Co.	2,982 0 0
Whitehead & Co.....	2,950 0 0
Allen & Sons	2,945 0 0
Kynoch & Co.	2,928 0 0
Derry	2,898 0 0
Brickell	2,845 0 0
F. & H. F. Higgs.....	2,800 0 0
Oldrey & Co.....	2,794 0 0
Kellaway, 57, White Lion-street, Pentonville (accepted)	2,573 15 0!

LONDON.—For additions to St. Charles's College, Bayswater, for his Eminence the Cardinal Manning. Mr. F. W. Tasker, architect:—

Colley	£2,645 0 0
Wall.....	2,413 0 0
Adamson.....	2,378 0 0
Higgs & Hill	2,340 0 0
Longley	2,245 0 0
J. & J. Greenwood	2,222 0 0
Patman & Fotheringham	2,217 0 0

LONDON.—For alterations, repairs, and fitting up new bar and shop-front, &c., at the "Crown and Seven Stars" public-house, Royal Mint-street, Minories, E., for the Cannon Brewery Co., Clerkenwell. Mr. J. C. Reynolds, architect, 30, Camberwell-green, S.E.:—

Jackson & Todd, Hackney-road	£1,389 0 0
Drew & Cadman, Holborn	1,227 0 0
J. Walker, Limehouse	1,187 0 0
Cocks, J. & Hy., Mile End	1,148 0 0

LONDON.—For a bakery and dwelling-house, at the corner of Cromer-street and Gray's-inn-road, for Mr. G. Hieber. Messrs. Tolley & Son, architects, 66, Cannon-street:—

Kingsman	£1,657 18 0
Drew & Cadman	1,630 0 0
Wall	1,562 0 0
Waddington	1,485 0 0
Marriage.....	1,440 0 0
Sayer (accepted)	1,365 0 0

LONDON.—For pulling down and rebuilding two dwellings and stables, for Mrs. H. Skinner, Mansfield-street, Kingsland. Messrs. G. & R. Low, architects:—

Kevan	£3,595 0 0
Bodien.....	3,577 0 0
J. A. Taylor	3,499 0 0
Ivory	3,464 0 0
Thomerson & Son.....	3,455 0 0
Holliday & Greenwood	3,377 0 0
Jarvis & Sons	3,250 0 0
Hale & Twitchen	3,047 0 0

LONDON.—For rebuilding No. 84, Leadenhall-street, and for additions and alterations to Nos. 81, 82, and 83, Leadenhall-street, for Mr. John Pound. Mr. Frank W. M. King, of Billiter Square-buildings, E.C., architect. Quantities supplied by Mr. W. Dunk, 36 and 37, Leadenhall-street:—

	Total amount.	Alterations.
Bywaters Bros.	£11,970	£3,230
H. L. Holloway.....	11,837	3,100
Holland & Hannen	11,809	3,367
Rider & Son.....	11,591	3,171
J. & J. Greenwood	11,487	3,330
Lawrance & Sons	11,480	3,205
Brass & Son.....	11,473	3,073
Colls & Sons	11,395	3,060
Ashby & Horner	11,290	3,036
J. T. Chappell	11,262	3,140
Perry & Co.....	11,160	2,873

LONDON.—For alterations, &c., at the "Volunteer" beer-house, Poplar. Mr. Wesley, architect:—

Walker	£231	0	0
Baney	195	0	0
J. A. Taylor	187	0	0
Fenwick	186	0	0
Bishop & Webb	164	0	0

LONDON.—For repairs to six houses at Seymour-street, Euston-road. Mr. B. Tabberer, architect:—

J. A. Taylor	£185	0	0
Whitbread	180	0	0
Johnson	169	17	6

LONDON.—For building Mission-hall in rear of No. 396, Mile End-road, E., for Messrs. L. Ososki & Co. Mr. Charles A. Legg, F.R.I.B.A., architect, 13, Grafton-street, E. Mr. W. Hawker, surveyor, 19, Gracechurch-street, E.C.:—

Kinlock	£485	0	0
Barnett	425	0	0
Hawkins	419	0	0
Harper	400	0	0
George Lusk (accepted)	385	0	0

LONDON.—For renovations and sanitary improvements at 2, Peterboro'-villas, Walham-green, S.W. Mr. F. W. Rhodes, architect, 3, Clifford's-inn, W.C.:—

Winser & Co, Buckingham Palace-road, S.W. (accepted)	£147	0	0

LONDON.—For alterations at the "Plough Tavern," corner of Hatcham-road and Penarth-street, for Mr. A. C. Mills. Mr. James F. Wesley, architect, 275, Romford-road, Forest Gate:—

W. Downs	£746	0	0
Hearle & Son	664	0	0
J. Walker	659	0	0
W. & F. Croaker	627	0	0
E. Alexander	598	0	0
M. Redman	593	0	0
J. A. Taylor	589	0	0

LONDON. — For fitting up 10 and 11, Warwick-lane, for Messrs. Hitchcock, Williams, & Co. Messrs. Searle & Hayes, architects:—

Shaw	£693	15	0
Barnett	666	3	6
J. & J. Greenwood	666	0	0

LONDON.—For the erection of a mission-hall, also alterations and additions, decorative and sanitary work, to 36, Porchester-terrace, W. Mr. Walter Stokes, architect. No quantities:—

Foxey	£2,390	0	0
Wittle	2,271	0	0
Chinchen, Kensal-green (accepted)	2,070	0	0

LONDON.—For repairs and decorations to 33, St. George's-square, for Mr. Walter Williams. Messrs. Rogers, Chapman, & Thomas, surveyors, 50, Belgrave-road, S.W.:—

Hales	£492	0	0
H. Smith & Son	470	0	0
G. Smith & Son	432	0	0
Hook	418	0	0
W. H. Lorden & Son (accepted)	375	0	0

LONDON.—For erecting façades, Craven-street, Strand, W.C. Mr. F. J. Chambers, architect, 11a, College-hill, Cannon-street, E.C.:—

W. H. Lorden & Son (accepted)	£469	0	0

LONDON.—For repairs and decorations at 42, Tregunter-road, South Kensington, for Lord Frederick Kerr. Messrs. Rogers, Chapman, & Thomas, surveyors, Wetherby-terrace, Earl's Court:—

Knight	£258	0	0
H. Smith & Son	219	10	0
W. H. Lorden & Son (accepted)	219	0	0

LONDON.—For strengthening floor in Emigration-room, and constructing new flue at Dr. Barnardo's Home, Stepney. Mr. R. H. Hill, architect, Lombard-court, E.C.:—

Harris & Wardrop	£406	0	0
H. L. Holloway	326	0	0
W. Sheppard	305	10	0
O. Craske	296	0	0
W. H. Lorden & Son (accepted)	260	0	0

NEWBURY (Berks).—For new dining-room and sundry alterations and additions to mansion, Donnington Holt, Newbury, for Colonel Howard Vincent, M.P. Mr. T. Marcus Houghton, architect, 10, John-street, Adelphi, W.C.:—

A. H. Houghton, Donnington, Newbury	£959	0	0

[No competition.]

MANCHESTER. — For alterations and additions to general offices, in Dale-street, for the Rochdale Canal Company. Mr. William Owen, architect, 134, Deansgate, Manchester:—

Jas. Hamilton, Bowden	£370	0	0
W. Southern & Sons, Salford	328	0	0
George Macfarlane, Manchester	314	0	0
Owen Williams, Manchester*	276	0	0

* Accepted.

MORDEN.—For completing four houses at Morden-park. Messrs. Rogers, Chapman, & Thomas, surveyors, 78, Gloucester-road, South Kensington:—

W. H. Lorden & Son (accepted)	£515	0	0

[No competition.]

SURBITON.—For heating (by hot-water low-pressure system) the New Assembly Rooms, Surbiton:—

J. Jones & Sons, 42, Farringdon street, E.C. (accepted)	£134	0	0

UPPER TOOTING.—For alterations and additions to "Falconhurst," St. Nicholas-road, for Dr. Mordaunt Matthew:—

W. H. Lorden & Son	£400	0	0

[No competition.]

URMSTON (near Manchester).—For the erection of three shops and dwelling-houses, for Mr. Jas. Fish. Mr. Wm. Owen, architect, 134, Deansgate, Manchester:—

Jas. Hamilton, Altrincham	£1,330	0	0
Adam Fox, Bowden	1,303	0	0
Butters & Carson Manchester	1,269	0	0
J. Spark, Urmston	1,265	19	6
Wm. Moore, Eccles	1,250	0	0
George Macfarlane, Manchester	1,245	0	0
Owen Williams, Manchester*	1,219	0	0

* Accepted.

For slaughter-houses and stables in connexion with the above.

Jas. Hamilton, Altrincham	£110	0	0
Adam Fox, Bowden	109	0	0
Owen Williams, Manchester (accepted)	104	0	0
Butters & Carson, Manchester	100	0	0
George Macfarlane, Manchester	99	0	0
J. Spark, Urmston	92	0	0
Wm. Moore, Eccles	82	10	0

WESTMINSTER.—For building Soldiers' Home and Institute, Caxton-street, for Miss Daniell. Mr. R. H. Hill, architect, 3, Lombard-court, E.C. Quantities supplied:—

Higgs & Hill	£5,244	0	0
E. Lawrence & Sons	5,080	0	0
J. Morter	4,994	0	0
B. E. Nightingale	4,994	0	0
J. T. Chappell	4,888	0	0
H. L. Holloway	4,700	0	0
Holloway Bros.	4,675	0	0
W. H. Lorden & Son (accepted)	4,619	0	0

Bank, Clapham Junction.—The list of tenders for the London and South-Western Bank, as given in our last, was inaccurate in some respects. The following is the correct list:—

Bryant	£6,731	0	0
Bowyer	6,642	0	0
Gould & Brand	6,427	0	0
Shepherd	6,200	0	0
W. Johnson	6,100	0	0
Chappell	6,049	0	0
Jas. Smith & Sons	5,987	0	0
Kynoch & Co.	5,875	0	0

TO CORRESPONDENTS.

Received.—W. H. C.—T. D.—A. S. T.—W. M. C.—F. J. L.—E. L. B.—A. R. W. S.—H. H.—T. R. H.—W. H. C.—G. H.—F. D.—A. L. & B.—C. S.—C. S. & Co.—C. F. M.—(We hardly think the announcement a suitable one to make through the columns of a paper. Many people would reply, "We prefer to choose our own inscriptions if we have any").—H. H. L. (should have sent amount of accepted tender).—J. G. & G. (see other letter on the subject).—T. B. (previously sent).—"Chilton Polden Church" (no sender's name).—T. B. & Co. (we have not received the official list of awards).—"Constant Reader" (should send his name and address).—R. (next week).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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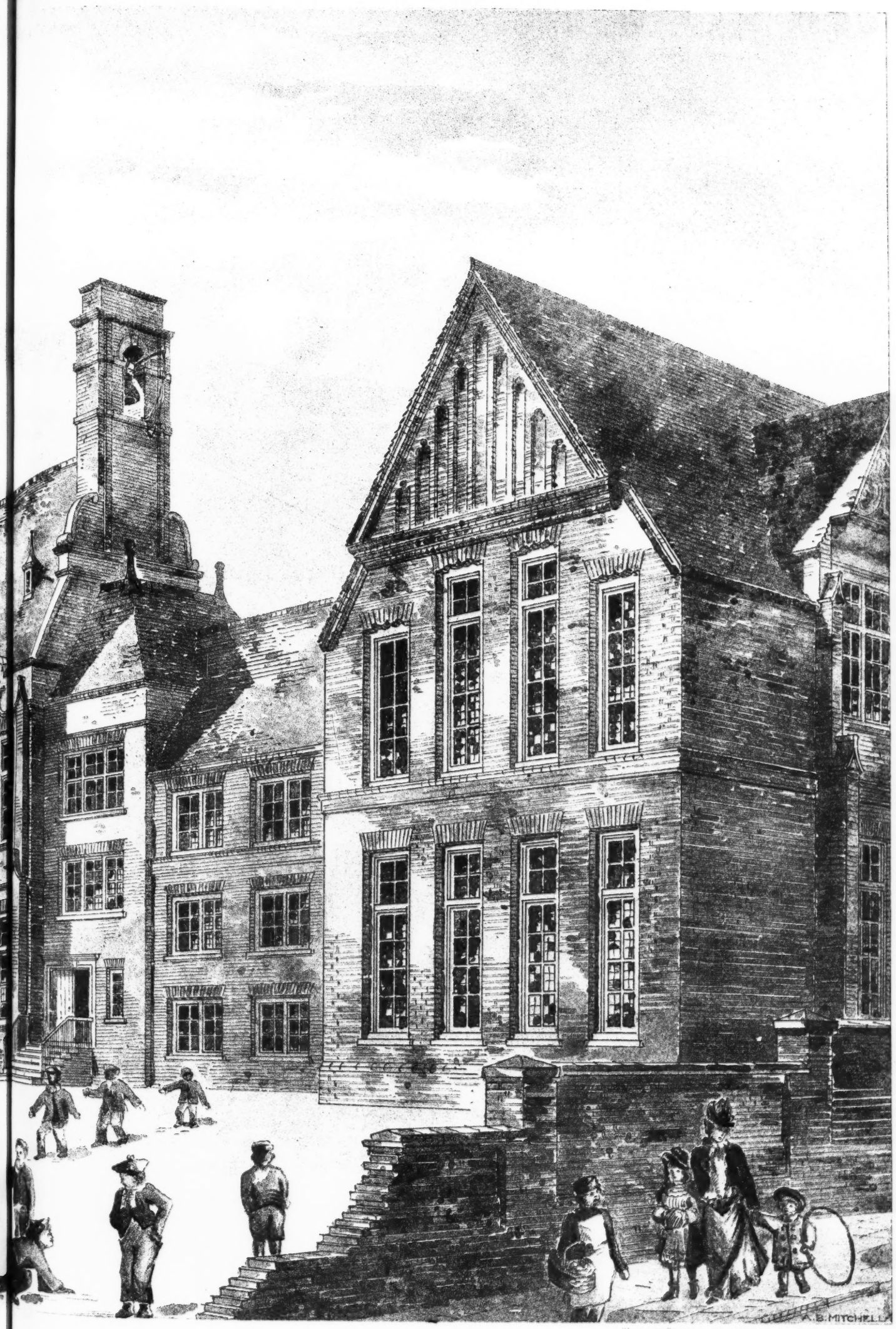

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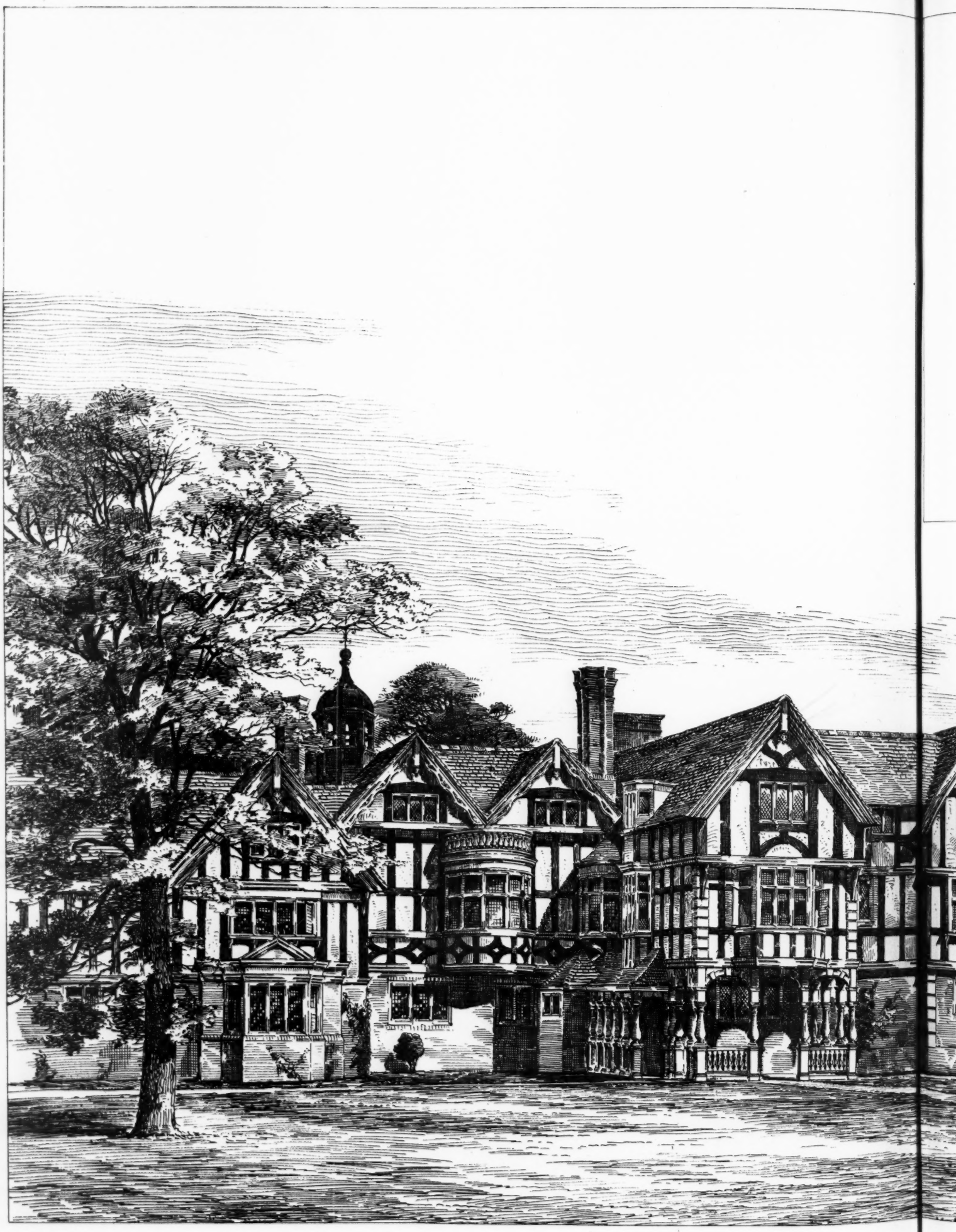

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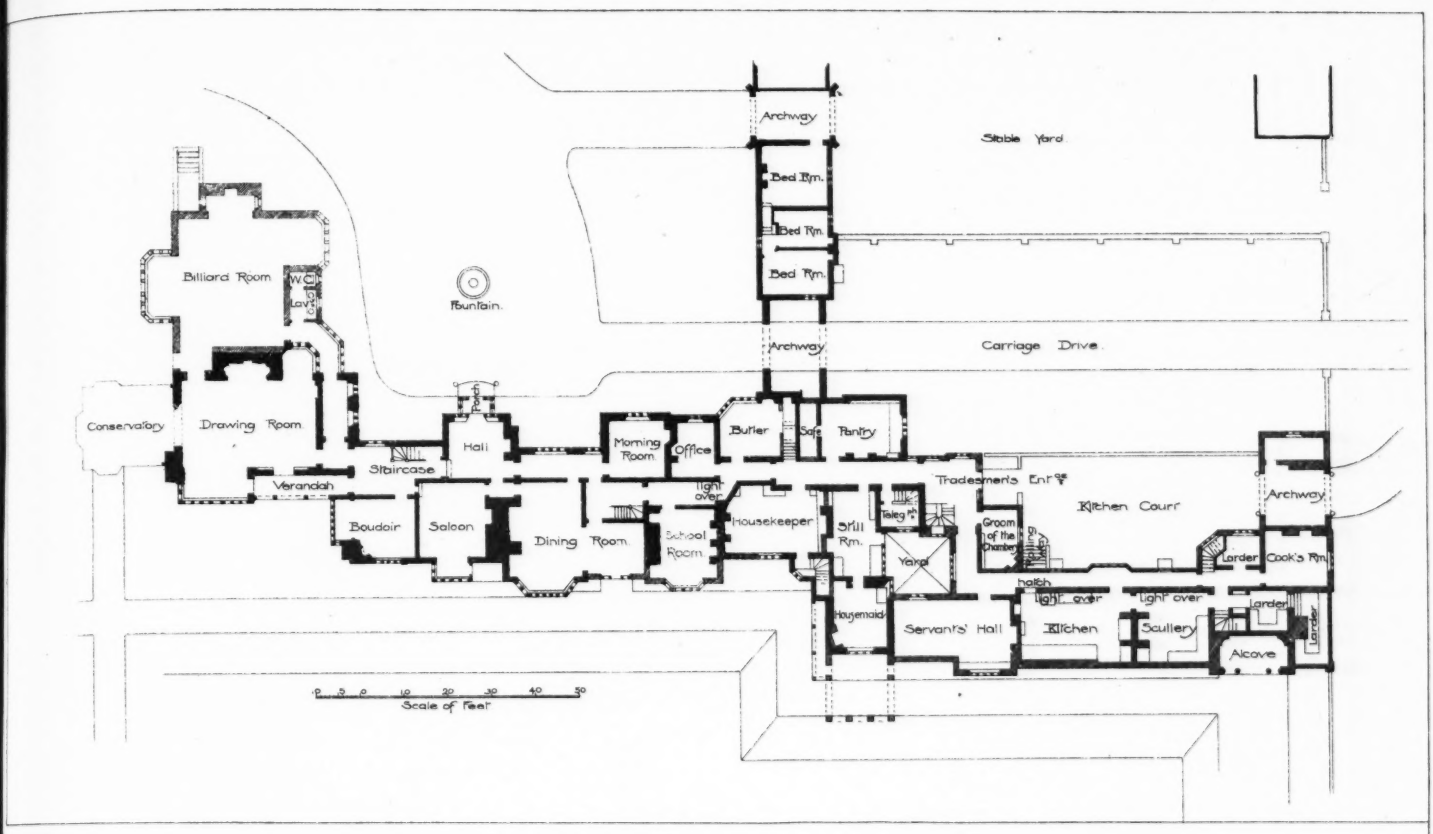

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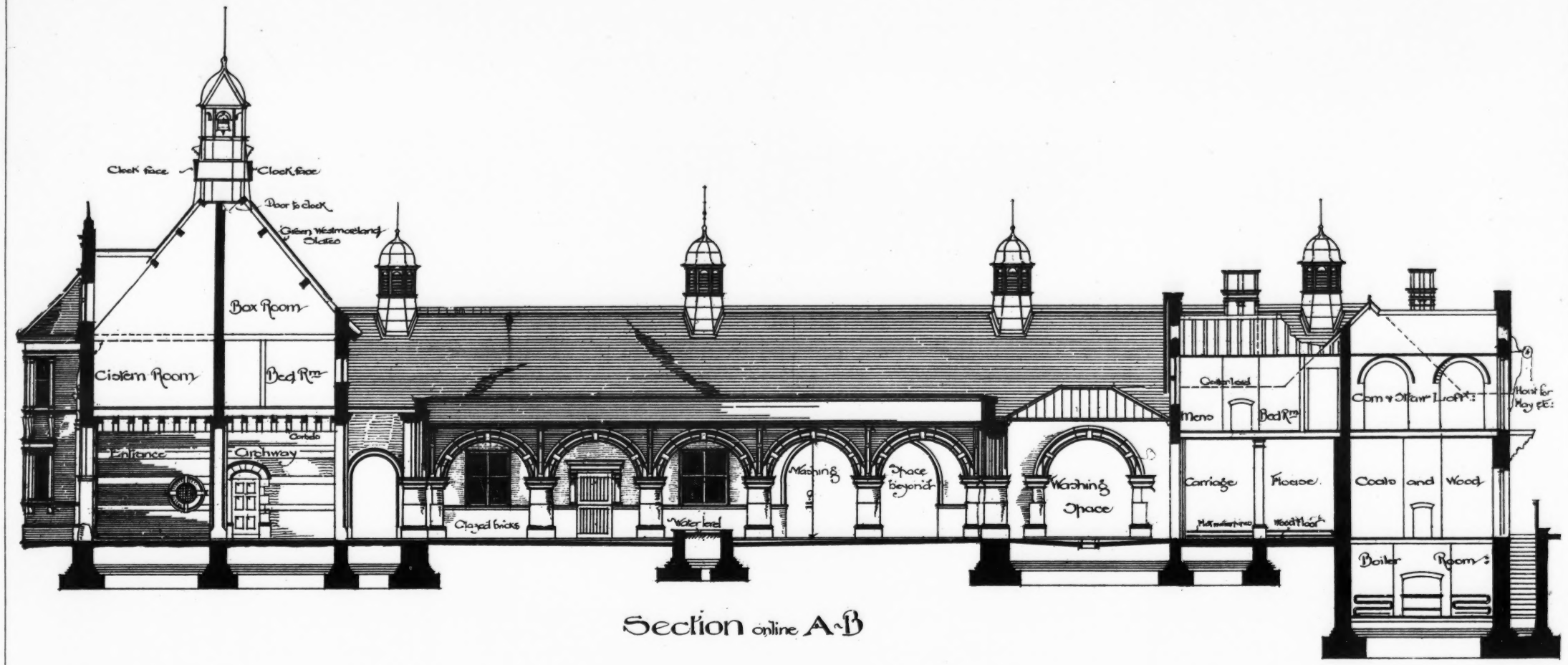

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